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ABSTRACT

The goal of the Analysis and Planning Project was to strengthen the nursing community's ability to analyze and plan for improved distribution of nursing personnel and services. The objectives aimed at (1) developing analytical models and a data base for planning purposes; (2) identifying new approaches to improve the distribution and delivery of care; and (3) increasing the knowledge of and participation by nurses in health planning. A project advisory committee was formed to assist throughout the project. Several task forces were named to work with staff on developing the State Model, to work with staff and the subcontractor on the National Model, and to work with staff in addressing concerns related to data. A Taxonomy Committee on Nursing Practice was formed to develop a system of nomenclature, terminology, and definitions that might eventually be adopted by the entire profession. The Project Executive Committee provided coordination and planning for meeting the objectives of the various activities. Finally, a National Panel of Expert Consultants was convened to project nursing requirements on a national and state-by-state basis five years into the future. The objectives set forth for the project were met by the end of the contract period. (BM)

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ANALYSIS and PLANNING for Improved Distribution of Nursing Personnel and Services

Final Report

Western Interstate Commission for Higher Education
National Center for Higher Education Management Systems at WICHE

Jo Eleanor Elliott
and
Jeanne M. Kearns

HEALTH MANPOWER REFERENCES

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December 1978

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Analysis and Planning for Improved Distribution of Nursing Personnel and Services, a project at the Western Interstate Commission for Higher Education (WICHE), was funded by the DHEW Division of Nursing, Health Resources Administration, Bureau of Health Manpower Contract No. 231-75-0803. The overall goal of the project was to strengthen, on a national scale, the nursing community's ability to analyze and plan for equitable distribution of nursing personnel and services.

The specific project objectives for the initial contract period (1975-1976) were:

- To develop an analytical approach to the projection of nursing requirements and resources one to five years ahead at state, regional, and national levels
- To develop a national model, using the system dynamics approach, for projecting nursing requirements and resources 5 to 20 years into the future
- To develop a data base, using existing data, by which to support such projections
- To plan for improved data collection in the future by which to support the analysis and planning of nurse manpower supply, distribution, and requirements
- To compile examples of innovative approaches for improving the distribution and utilization of nursing services
- To demonstrate the effectiveness of a select sample of such approaches by sponsoring demonstration projects in various geographical and clinical settings
- To analyze the cost effectiveness of selected approaches to the delivery of nursing care
- To support regional centers to analyze nurse manpower supply and distribution, to train staff for regional centers, and to help establish communication networks for regional and state level planning
- To train nurse leaders in the use of analytical models and data bases as planning tools
- To conduct national conferences to discuss progress and products of the project and issues related to planning
- To evaluate the activities within the project period
- To design an evaluation plan to determine the impact of the project within a two-year period after its conclusion.

The specific project objectives for the extension period (1976-1977) were:

- To pilot test the State Model developed during the initial contract period
- To project nursing requirements at national and state-by-state levels five years into the future.

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The study upon which this publication is based was supported by Public Health Service contract number 231-75-0803 from the Division of Nursing, Health Resources Administration.

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Foreword

In March 1975, the Division of Nursing entered into a contract with the Western Interstate Commission for Higher Education (WICHE) to carry out specified activities that would significantly strengthen the nursing community's capability to analyze and plan for the improved distribution of nursing personnel and resources. The passage of the Nurse Training Act of that year and the National Health Planning and Resources Development Act of 1974 greatly stimulated the need for new planning methodologies. The project was directed toward three major objectives: (1) developing new methodologies for projecting nursing requirements and resources at the national and state levels, (2) developing a planning capability among nursing leaders throughout the Nation, and (3) providing insights into ways of improving the distribution of nursing personnel and services.

A complex undertaking of the project was the development of a model for estimating state nursing requirements five years head. Using this planning process, the National Panel of Expert Consultants developed assumptions and criteria for projecting nursing requirements nationally and on a state-by-state basis for five years into the future. The panel was appointed by WICHE and included experts in the fields of nursing, higher education, hospital and health administration, operations research, and economics. The results of the panel's deliberations are included here as Chapter VI.

This publication includes, as well, descriptions of the various activities conducted as part of the project. Two other project publications provide more detailed information on selected aspects of the project: *Inventory of Innovations in Nursing* and *National Conferences*. In addition, data bases, projection techniques, and a set of users' manuals which contain the technical details necessary to operate the State Model were developed by the project staff.

A major premise of this project was that if nurses are to provide leadership in determining nursing's future role in health care delivery, it is critical that the capability to analyze and plan for nursing manpower development and utilization be increased. It is expected that this publication will contribute to the advancement of that capability.

In many aspects, the project described herein is a landmark in the field of nurse planning. It will be useful to all who are concerned with improving the availability and quality of nursing services.

Jessie M. Scott

Jessie M. Scott
Assistant Surgeon General
Director
Division of Nursing

Preface

The Western Interstate Commission for Higher Education entered into a contract with the Division of Nursing in March 1975 to carry out the project Analysis and Planning for Improved Distribution of Nursing Personnel and Services. The goal of the project was to significantly strengthen the nursing community's capability to analyze and plan for the improved distribution of nursing personnel and resources.

This Final Report provides an overview of the total project. Included are summaries of each of the activities related to the development of analytical models, to the development of the data base and improvement of data collection, to new approaches being used by nurses to improve delivery and education, and to the three major activities that will increase the knowledge and participation of nurses in health planning—regional centers, training workshops, and national conferences.

The report of the National Panel of Expert Consultants, which was convened by WICHE during 1977, is included in its entirety. Separate reports and other publications, which have been produced during the course of the project, describe each of the project activities and outcomes in more detail.

In summary, the outcomes of this project demonstrate that nurses indeed can play a major role in health planning and that nurses already are carrying out new approaches that improve care and education. The results of the Panel's work on the requirements for nurses and the projections for nursing resources for 1982 clearly indicate that there is an overall shortage of nurses, nationally, and in particular that there is a critical shortage of nurses prepared at baccalaureate and higher degree levels.

To ensure that the impact of this project continues and that health care delivery will benefit from it is now up to the states. Under nursing leadership, each state must carry out its own studies, having available the approaches and materials developed under this contract, to determine the unique state requirements and the resources for meeting those requirements.

The many individuals involved in this project are commended for their contributions. Their efforts, the time devoted to the project, and the money expended will be worthwhile only if the products developed under the contract are used, refined, and updated.

Jo Eleanor Elliott

Jo Eleanor Elliott
Project Director

Chapter I
Overview of the Project

Introduction

Access to and the provision of quality health care for all the citizens of the United States is a goal toward which we as a nation continually strive. The activities described in this report are representative of activities that are necessary to plan for and to provide improved health care delivery. Important relevant information for those concerned with health care has been provided by the activities of the project Analysis and Planning for Improved Distribution of Nursing Personnel and Services, as described in this final report, and by the individual reports and publications from the project already in print.

This chapter provides an overview of the total Analysis and Planning Project—the underlying needs, the contract undertaken to carry out the objectives and the methodologies used to achieve them, the consequent outcomes, and the dissemination of the project's activities. Succeeding chapters describe specific activities in greater detail.

Need

New planning methodologies and new approaches for the delivery of health care are essential if the people of this country—regardless of socioeconomic factors, ethnic background, and geographic location—are to receive fair, equitable, and timely care through a coordinated health delivery system. According to Scott, "Planning is indeed the mood in this country. . . . Nationally, planning for health care, an old need, is becoming a new reality. [The need is] to ensure reality for the kind and amount of nursing care in correct proportion to the needs of the people."[1]

The nursing profession has the responsibility for planning for nursing. Therefore, it must delineate its roles in the health delivery system and provide sound education of nurses for these roles to ensure quality in the delivery of nursing care. Nursing must work collaboratively with other disciplines in planning for and in providing health care. These statements reflect the genesis and the aim of the Analysis and Planning for Improved Distribution of Nursing Personnel and Services Project, which was undertaken by the Western Interstate Commission for Higher Education (WICHE), through a contract with the Division of Nursing, Health Resources Administration, Public Health Service, Department of Health, Education, and Welfare.

The Division of Nursing sought to facilitate the forward planning necessary to improve health care delivery. At the time the contract started (March 17, 1975), it was anticipated that the Nurse Training Act of 1975 would require information on the supply and distribution of and the requirements for nurses. The Act (P.L. 94-63, Title IX), passed July 29, 1975, did specify in Section 951, Part D, the specific information to be reported to Congress. (See Internal Appendix A in Chapter VI for this specific section of the Act.) In addition to the Nurse Training Act, the Health Planning and Resources Development Act of 1974, P.L. 93-641, also requires planning for health manpower of which nursing is a major component.

The Contract

The Western Interstate Commission for Higher Education was seen as having the capability for carrying out a project of this stature to assist the Division of Nursing in meeting its goals related to nursing requirements and resources. This had been demonstrated not only through its own organization, which included its Nursing Program Unit and the National Center for Higher Education and Management Systems (NCHEMS) at WICHE,[2] but also through its relationship and experiences with other regional groups.

The Western Council on Higher Education for Nursing (WCHEN) functions as WICHE's advisory council on nursing. It includes representatives from the 163 collegiate schools of nursing and their clinical agencies in the West. WCHEN had undertaken two earlier needs and resources studies, one in the late 1950s and a second in the mid-1960s.[3] These early studies addressed only numbers of nurses needed; they did not address the matter of distribution of nursing skills and services. The later study made clear that existing projection techniques were inadequate. For example, the impact of nurses using skills in different ways and nurses having preparation for various kinds of practice was not being taken into account. In 1974, WCHEN established as its priority goal the updating of the needs and resources study and the development of models to provide projections of nursing requirements and resources. The Division of Nursing's needs for information for planning and WICHE's concerns in the area of planning thus coincided, merged, and the very comprehensive activities of this project were launched.

The contract, initiated on March 17, 1975, was for an 18-month period. A one-year extension was authorized to permit pilot testing of the model and to convene a National Panel of Expert Consultants to use the State Model process in determining nursing requirements on national and state-by-state basis. The contract was concluded on December 31, 1978, following additional time to allow preparation of the final report.

Objectives

The goal of the Analysis and Planning Project was to strengthen the nursing community's ability to analyze and plan for the improved distribution of nursing personnel and services. The objectives set forth have thus aimed at: (1) developing analytical models and a data base for planning purposes, (2) identifying new approaches to improve the distribution and delivery of care, and (3) increasing the knowledge of and participation by nurses in health planning.

The project's specific objectives within these three major areas were as follows:

1. *Analytical Models and Data Base*
   - To develop an analytical approach to the projection of nursing requirements and resources one to five years ahead at state, regional, and national levels
   - To develop a national model, using the system dynamics approach, for projecting nursing requirements and resources 5 to 20 years into the future
   - To develop a data base, using existing data, by which to support such projections
   - To plan for improved data collection in the future by which to support the analysis and planning of nurse manpower supply, distribution, and requirements.
2. *New Approaches for Improving Distribution and Delivery of Care*
   - To compile examples of innovative approaches for improving the distribution and utilization of nursing services
   - To demonstrate the effectiveness of a select sample of such approaches by sponsoring demonstration projects in various geographical and clinical settings
   - To analyze the cost effectiveness of selected approaches to the delivery of nursing care.
3. *Increased Knowledge of and Participation by Nurses in Health Planning*
   - To support regional centers to analyze nurse manpower supply and distribution, to train staff for regional centers, and to help establish communication networks for regional and state level planning
   - To train nurse leaders in the use of analytical models and data bases as planning tools
   - To conduct national conferences to discuss progress and products of the project and issues related to planning.

The project also set forth the following objectives related to evaluation:

- To evaluate the activities within the project period
- To design an evaluation plan to determine the impact of the project within a two-year period after its conclusion.

In line with the overall goals and for the legislative mandate to project requirements for nurses, an extension period was granted to allow the time:

- To pilot test the State Model developed during the initial contract period
- To project nursing requirements at national and state-by-state levels five years into the future.

The objectives indicate the complexity of the work undertaken. Although the objectives may be perceived as separate and somewhat unrelated, the sum effect of achieving all the objectives would be the improved planning for and delivery of nursing care to the citizens of this country. The broad scope of the Analysis and Planning Project and its numerous objectives could help "ensure that nursing manpower, a national resource, attains its highest possible potential for National effectiveness"[4] within the total health care delivery system.

Methodology

Because of the scope of the objectives to be accomplished in the initial contract period of 18 months, nearly every facet of the project had to be undertaken simultaneously. Within the first three months, most of the staff were in place, committee and task force members had been named, and subcontractor negotiations were underway. Chapter VII includes a listing of staff, committee and task force members, and subcontractors.

The work was carried out by WICHE staff members, with guidance from the Project Officer and with close collaboration of other Division of Nursing staff. Also participating were subcontractors plus hundreds of nurses and others concerned with improved planning for health care delivery who participated in one or more activities.

Committees, Task Forces, and Panel

Various committees and task forces were established. A Project Advisory Committee included members of the WCHEN Executive Board, representatives from the regional centers, the American Nurses' Association, the National League for Nursing, plus the DHEW, Public Health Service regional consultants for Regions VIII, IX, and X, headquartered in Denver, San Francisco, and Seattle. The Advisory Committee assisted through subcommittee work, through receiving reports, by giving advice on all aspects of the project, and in its recommendations of possible members of the task forces and contacts for the *Inventory of Innovations in Nursing.*[5] In addition, the Advisory Committee suggested participants for the national conferences. The committee recommended ways that information about the project could be disseminated broadly to those who might be affected by the outcomes of the project and who might use its products both within and outside the nursing profession.

Task forces were named to work with staff on developing the State Model, to work with staff and the subcontractor on the National Model, and to work with staff in addressing concerns related to data. Stemming from problems of definitions within the data base materials, the Advisory Committee recommended the creation of a Taxonomy Committee on Nursing Practice to begin developing a system of nomenclature, terminology, and definitions that might eventually be adopted by the entire profession.

The members of the task forces and the Taxonomy Committee represented experts from nursing, education, and planning. Each of these groups met four to eight times during the initial project period. The WICHE staff prepared working documents for the meetings, at which the members discussed and made recommendations to effectively meet project objectives. A joint meeting of the Advisory Committee, the task forces, and the Taxonomy Committee was held in April 1976. This meeting provided the opportunity for mutual sharing and discussion of project products.

The project Executive Committee met at least monthly for the first 18 months of the contract period. This committee consisted of the Project Officer and staff at WICHE.[6] Subcontractors attended by invitation those sessions specifically addressing subcontractor work and/or product(s). Special meetings of selected staff and specific subcontractors were called as needed. The Project Executive Committee provided coordination and planning for meeting the objectives of the various activities, and kept the Project Officer fully informed of the progress and problems of carrying out such a massive, multi-faceted national project.

During the extension period from September 1976 to September 1977, a National Panel of Expert Consultants was convened to project nursing requirements on a national and state-by-state basis five years into the future. The panel members, who were selected by WICHE staff in consultation with the Division of Nursing, represented nursing service, nursing education, higher education, administration, health planning, operations research and economics, and associations such as the American Nurses' Association, the National League for Nursing, and the American Hospital Association. Some of the members had served on the State Model and National Model task forces.

During the entire contract period, WICHE and Division of Nursing staff members scheduled workshops periodically to address specific issues or problems and to develop work plans. Such meetings also included discussions of drafts of the *Panel of Expert Consultants: Final Report*[7] and this report.

The Calendar of Events shown in Chapter VII contains a listing of the meeting dates of these groups. The individuals who served on the Project Advisory Committee, the various task forces, the Taxonomy Committee, and the National Panel are listed in that chapter.

Development of Models and Data Base

State Model

Various modeling techniques were analyzed, reviewed, and presented to the State Model Task Force. The WICHE staff, with the advice of the task force, representatives from the field development states, and participants at the national conferences, developed the planning process that is referred to as the State Model. The approach was later refined through pilot testing and through application by the National Panel of Expert Consultants.

The states participating in the field development of the State Model were selected through the use of a modified request-for-proposal (RFP), which was sent to 45 organizations in 27 states. Organizations in five states were selected as sponsors for testing the model.[8] They represented a state board of higher education (Illinois), a state office of planning emanating from the governor's office (Iowa), a state office for comprehensive health planning (Louisiana), a university health sciences center (New Mexico), and a state nurses' association (Vermont). State review panels were formed, and a combined total of 19 state meetings and workshops were held.[9] (See Chapter VII for the Calendar of Events.)

During the extension period, the model was pilot tested by six states. Field development states were given first option to be pilot test states; three of the five selected the option (Iowa, Louisiana, and New Mexico). In addition, three states were selected by staff to represent a state postsecondary education commission (Washington), a large state with complex nursing requirements and educational resources (New York), and a small state with the state nurses' association as sponsor (Rhode Island). Most pilot test states either continued an existing panel or established a panel of health, education, and planning professionals requisite to the State Model process. The sponsoring organization in each pilot test state sent one or two representatives to a series of four meetings at project headquarters. Staff provided consultation to states as requested. Mississippi and Colorado sent observers to the pilot test meetings.

The model was further refined by the National Panel of Expert Consultants as this group applied the model to assist the Division of Nursing obtain data for its 1978 Report to Congress. In May 1977, the National Panel of Expert Consultants met with the pilot test state representatives to share results of applying the planning process at the state specific level and at the national level.

National Model

The National Model, developed under a subcontract with Pugh-Roberts Associates, Cambridge, Massachusetts, involved the active participation of the National Model Task Force and the coordination of activities by the WICHE staff. The task force members provided the set of factors contained in the model, responded to the formulations in the model, indicated when an acceptable simulation was achieved, and made recommendations for post-project work on the model.

Data Base

The data base consisted of then currently existing data. No new data could be collected under the terms of the contract, primarily because of the short time frame. To develop the data base, the WICHE staff, with assistance from one of the project subcontractors, Information Management Systems, Inc., assembled more than 20 data sources that provided comparable information that was available for all states. These data were analyzed and synthesized. The data sources were categorized, and descriptive information for each source was provided in *A Directory of Nursing-Related Data Sources.*[10]

The Long Range Data Collection and Use Task Force provided assistance to the staff in developing a framework for nursing-related data and in making recommendations to improve data collection and use in the future, resulting in the report *A Blueprint and Recommendations for Improved Nursing-Related Data.*[11] The task force also reviewed the *Directory.*

The data base was also assessed by the Taxonomy Committee which met four times and initiated the first steps in providing standardized descriptors of nursing practice.

New Approaches for Improving Distribution and Delivery of Care

Demonstration Projects

A request-for-proposal for one-year projects to demonstrate the effectiveness of innovative approaches to improved distribution of nursing personnel and services was sent to more than 650 health and education institutions and agencies, professional associations, and individuals across the country. Thirty-five proposals were submitted for review. A subcommittee of the Advisory Committee selected the projects that met predetermined criteria; seven were awarded subcontracts. A cost-effectiveness analysis of four of the subcontracts was carried out by a consultant.

Innovations

A nationwide search for innovations in the delivery of nursing care was conducted. The term innovation was used to apply both to first-time-ever experimentation and to an approach being attempted for the first time in a given setting. Professional journals, inquiries to individuals and to health and professional associations and agencies, news releases, a search of nursing literature, and all of the project-related groups were resources used for obtaining information on innovations. All the reports of innovative approaches that were submitted in response to the search efforts were included in the previously mentioned *Inventory of Innovations in Nursing.* The *Inventory* also includes summaries of the demonstration projects and the cost-effectiveness report.

Increasing Knowledge of and Participation of Nurses in Health Planning

Regional Centers

Existing regional interstate compact agencies in higher education, each with nursing education consortia, were logical sites for regional centers. Contacts had been made with staff from WICHE's counterparts, the New England Board of Higher Education (NEBHE) and the Southern Regional Education Board (SREB), even before the Project started. Subcontracts with these boards were negotiated and initiated early in the contract period. The western regional center was a part of the on-site project effort with special staffing for a six-month period.

At the time of the initial work of the Analysis and Planning Project, the Midwest states had no interstate higher education compact agency. Because an earlier Division of Nursing supported regional project in continuing education for the Midwest was housed at Saint Louis University, a base of available information there made it appropriate for Saint Louis University to serve as the locus of the regional center for the 13 midwestern states.

Four states (New Jersey, New York, Pennsylvania, and Delaware) and the District of Columbia were not included in any regional grouping. The constraints of time and the absence of any base for interstate activity in nursing led to the decision to obtain maximum participation by individuals, but not to create a formal network among these states solely for this project.

Training

Working with another of the subcontractors—Nursing Care and Consultation, Ltd.—staff planned and carried out training activities in the West and assisted the other regional centers with their training efforts.

Trainees were nominated by themselves or others and were selected according to criteria that would facilitate implementation of Project efforts. The regional centers selected the participants for their respective training sessions, and the WICHE staff selected the participants for the train-the-trainer session.

National Conferences

All Project task forces, the Advisory Committee, the staffs of the regional centers, demonstration project representatives, and field development representatives were invited to both national conferences.

A mixture of nurses and other professionals concerned with health planning were invited to the conferences. At least two representatives from each state were invited and were requested to plan participation at both conferences. Suggestions for invitees came from all Analysis and Planning Project committees, state nurses' associations, and staff, with the final selection by staff.

Evaluation

Requests for proposals for evaluation were sent to research groups known to the WICHE staff. A subcontract with the American Institutes for Research in the Behavioral Sciences (AIR) of Palo Alto, California, was executed (1) to carry out an internal process evaluation and (2) to design the post-project impact evaluation. The internal evaluation methods included direct observations, interviews of staff and regional representatives, of training participants, of field development representatives, and review of internally circulated documents and meeting evaluation forms and questionnaires. The impact design is contained in Chapter VII.

Outcomes

The objectives set forth for the project were met by the end of the contract period.

Analytical Models and Data Base

State Model

The planning process referred to as the State Model which was developed and tested provides an analytical approach to the projection of nursing requirements and resources at state, regional, and national levels one to five years into the future. The model is fully described in *Nursing Resources and Requirements: A Guide for State-Level Planning*[12] and is summarized in Chapter II of this report. The model has been pilot tested in Iowa, Louisiana, New Mexico, New York, Rhode Island, and Washington. At the time of this report, four states have completed the work. Mississippi, which was an observer state to the pilot testing, has completed its application of the State Model process. Colorado has used the State Model process to determine nursing requirements and resources that served as the basis for recommendations for priority programming for nursing education in that state. The effort was supported by the Colorado Commission on Higher Education.

A National Panel of Expert Consultants was convened in 1977 to use the State Model process to project nursing requirements nationally and on a state-by-state basis to assist the Division of Nursing in preparing its Report to Congress required by the Nurse Training Act of 1975. Based on the projected requirements, the panel made recommendations in four major areas: (1) strengthen the educational preparation of nurses in practice, (2) improve the distribution of nursing services and the delivery of health care, (3) improve the practice of nursing, and (4) improve planning to provide adequate educational programs and a sufficient supply of nurses for health services. The complete report of the panel is found in Chapter VI.

At least two additional states have contracted with consultants to use the State Model, and a third state has submitted a grant proposal for funds to support a study using the model. Other states that have participated in regional meetings about the planning and the role of the State Model (DHEW Regions VIII and X) are considering the model's use.

Application of the State Model planning process at the regional level is being made to the 13 western states. This regional application will facilitate regional planning for nursing education, especially at the graduate level, and will provide guidelines for interstate efforts to address the problems of distribution of nursing personnel and services.

The State Model developed under this contract provides a new approach to projecting requirements and resources. The evaluations by those who have used the model indicate that it is a useful analytical tool that takes into account key variables for planning.

National Model

The National Model, which applies the system dynamics technique to nursing, has been used to project nursing requirements into the future over a 20-year time span. A baseline simulation provided projections for 1980 and 1990 that involved no major changes in the health care system or the role of nursing. Four simulations examined the effects of major health system changes on nursing, and four additional ones examined changes directly related to nursing. The National Model is fully described in the *National Model of Supply, Demand, and Distribution, Final Report,*[13] and is summarized in the National Model's *Summary Report*[14] and in Chapter II of this report.

The model provides a means to test certain assumptions and to test the effects of selected "what if" questions for policy analysis. As now developed, the model is applicable only at the national level.

The Division of Nursing has the data base and the program that provide the capability for running the National Model. As more current data are available, the updated data base will be used in running the model.

Data Base and Profile Reports

The most comprehensive data base ever compiled from nursing and nursing-related data was assembled. As a result of project efforts related to the data base, profile reports developed for each state contain the data necessary to the state modeling process. These 54 reports contain data on social and economic characteristics of the population, health needs and health status of the population, facilities and services within the health care system, nursing personnel (registered nurses, licensed practical nurses, and aides), and nursing education and licensure statistics.

The extensive data base was used in making projections with the National Model and was used by the National Panel of Expert Consultants and the pilot test states in making their projections. Users' manuals have been prepared to assist planners in using and generating profile reports. These manuals, in conjunction with *Nursing Resources and Requirements: A Guide for State-Level Planning,* the users' manuals for calculation of requirements and resources, and the *Panel of Expert Consultants: Final Report,* provide the base for state and substate planning for nursing requirements and resources.

Taxonomy

The Taxonomy Committee on Nursing Practice made the first step in developing a taxonomy that will lead to standardization of descriptors of nursing practice. The report of this committee, which is included in Chapter III, should serve as the basis for future endeavors to meet the important needs in relation to definitions of nursing practice. The American Nurses' Association has accepted the responsibility for continuing this effort.

Future Data Efforts

The report titled *A Blueprint and Recommendations for Improved Nursing-Related Data* includes a framework for nursing-related data, a set of categories and definitions for the most commonly used data elements, and a set of recommendations for improving nursing-related data and access by users. Some of these recommendations have already been implemented by data collectors. The results of this endeavor are included in the *Blueprint* and summarized in Chapter III.

To allow the user to obtain access to nursing-related data, *A Directory of Nursing-Related Data Sources* was compiled. This document identifies existing data sources and provides a "fact sheet" for each of the 63 data sources included. More information on *A Directory* is included in Chapter III. The Interagency Conference on Nursing Statistics (ICONS) is updating this directory as it is viewed as a valuable document for planners. This updated directory will be published by the National Health Planning Information Center (NHPIC) in 1979.

New Approaches for Improving Distribution and Delivery of Care

Published in 1977, the *Inventory of Innovations in Nursing* described 152 innovative ways nursing skills are being used to improve health care. In addition, the seven demonstration projects are described in the *Inventory.* These projects addressed problems such as the care of the elderly, access to health care for ethnic people of color, targeted occupational health nursing in small industries, community health and hospital care in rural settings, and staffing patterns related to nursing care outcomes. For four of the demonstration projects, an assessment was made of cost effectiveness and the results are included in the *Inventory.*

Increasing Knowledge of and Participation by Nurses in Health Planning

Regional Centers

Regional centers were supported in four parts of the country, covering 46 states. These centers facilitated the dissemination of information about the project, conducted training programs within each region, provided names of potential participants for the various project activities, and provided consultation to staff. A brief description of the regional centers is contained in Chapter V, and a full report, *Regional Centers,*[16] was produced among the reports of the contract.

Training

There were 263 nurse leaders from throughout the United States trained in the use of analytical models and data bases as planning tools for improving the distribution of nursing expertise. In addition, to facilitate the use of the training materials in the future, a "train-the-trainers" session was attended by 26 nurses. A comprehensive manual, *A Manual for Training,*[16] was developed, which can be used in the educational preparation of nurses in planning. The training component is described in more detail in Chapter V.

National Conferences

Two national conferences each brought together more than 250 nurses, health planners, and others concerned with health care and with the educational preparation of health care workers. The first conference was held in the early part of the contract period, the second near the end of the initial contract period. The conferences provided for sharing of the activities of the Analysis and Planning Project, obtaining conferees' reactions to the project's products, and discussing the issues related to planning. The conferences are briefly described in Chapter V. *National Conferences,*[17] published in 1977, provides information about the various project activities and includes key addresses, issue papers, and workshop summaries.

Evaluation

Two facets of evaluation of the total project were carried out. The evaluation plan for determining the impact of the project following its completion is outlined in Chapter VII. The entire evaluation plan has been transmitted to the Division of Nursing, DHEW, for possible future implementation.

The internal process evaluation addressed all components of the project. The evaluation did indicate that initially there was some confusion regarding specific objectives to be achieved through each activity. Communications were not always clear because of the size of the project and large numbers of people involved. The results of the evaluation of various aspects of the activities are incorporated into the various reports of the activities.

Dissemination

The size and nature of the project dictated that, in addition to those participating in the various activities, many people in the health field and related areas (such as education and legislative fields) needed to be made aware of the project—its goals, programs, and potential products. Even before the contract was signed, meetings were held with groups and individuals who would potentially be involved.

The WICHE staff and the Project Officer responded to as many requests as possible for presentations about the project. In some instances, both staff and the Project Officer participated in the same conference.

The national conferences were conceived and conducted to share, with a nationwide audience representing nursing and other health education professionals, the various segments of the project. They were also intended to keep such an audience continuously informed and to use the conferees' responses to improve the products.

A "Project Update" was issued periodically during the first 18 months to those on the mailing list, which numbered over 5,000. In addition to progress reports, specific relevant topics were addressed more fully in selected issues of the "Update." (Chapter VII contains an example.)

A total of 15 reports were prepared describing specific project activities. Several provide specific information and instructions about using the products resulting from the Analysis and Planning Project. Three major publications (including this report) have had wide distribution. The major reports and the publications are included in the nursing component of the National Health Planning Information Center and are available through the National Technical Information Service (NTIS). All reports and publications are described in the Annotated Bibliography in Chapter VII.

This introductory chapter has provided an overview of the total project. Thus, only brief descriptions of the methodologies used and the outcomes in relation to the specific project objectives have been presented. The remainder of this report provides a more detailed description of all project activities. Chapter II provides summaries on the State and National Models; Chapter III describes the creation of the data base, the long-range data problems and concerns, and the taxonomy effort; and Chapter IV provides information on new approaches for improving the distribution and delivery of nursing care. The efforts to increase knowledge of and participation by nurses in health planning are more fully developed in Chapter V. Chapter VI reproduces the *Panel of Expert Consultants: Final Report* in its entirety, plus an addendum comparing requirements and resources for registered nurses and licensed practical nurses for 1982. Chapter VII provides specific information on resources to the project (both human and financial,) the calendar of events, the impact evaluation design, an example of the Project Update, and the annotated bibliography of publications and reports.

FOOTNOTES

1. Jessie M. Scott, Remarks quoted in *National Conferences,* edited by Pauline Gingras (Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-3), 1976), p. 3.
2. In July 1977, the National Center for Higher Education Management Systems at WICHE became a separate and an independent organization.
3. Western Interstate Commission for Higher Education, *Nurses for the West* (Boulder, Colo.: 1959); and Western Interstate Commission for Higher Education, *Today and Tomorrow in Western Nursing* (Boulder, Colo.: 1966).
4. Scott quoted in Gingras, *National Conferences,* p. 7.
5. Sheila Kodadek, ed., *Inventory of Innovations in Nursing* (Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-2), 1976).
6. Bernice Szukalla, Chief, Health Manpower Branch, Division of Health Resources Development, Region VIII, Denver, also served as a member of the Executive Committee.
7. Jean L. J. Lum, with Gregory Leonhard, *Panel of Expert Consultants: Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978).
8. It was planned that these states would participate in the development and pilot testing of the model during the initial contract period. As the developmental phase extended throughout the 18-month period, pilot testing was necessarily deferred, and the project activity with these states became "field development" to describe more accurately the participation of these five states.
9. Esther Bright, *The Field Development Component of the State Modeling Activities, Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
10. Mark K. Smith, with Jerome Felix, *A Directory of Nursing-Related Data Sources* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
11. Douglas J. Collier, with Mary Segall, *A Blueprint and Recommendations for Improved Nursing-Related Data* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
12. Robert Gray and Ken Sauer, *Nursing Resources and Requirements: A Guide for State-Level Planning* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978).
13. Tom Bergan and Gary Hirsch, *A National Model of Supply, Demand, and Distribution, Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
14. __________, *A National Model of Supply, Demand, and Distribution, Summary Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1976).
15. Pauline Gingras, *Regional Centers, Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
16. Mactavish, J. Kevin, ed., *A Manual for Training in Analysis and Planning for Improved Distribution of Nursing Personnel and Services* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1976).
17. Gingras, *National Conferences.*

Chapter II
Analytical Models

The objectives for the development of analytical models were:

- To develop an analytical approach to the projection of nursing requirements and resources one to five years ahead at state, regional, and national levels.
- To develop a National Model, using the system dynamics approach, for projecting nursing requirements and resources 5 to 20 years in the future.

Two major modeling efforts were undertaken. The model developed to project resources and requirements at state, regional, and national levels one to five years ahead, came to be referred to as the State Model. The model developed to project requirements and resources at the national level further into the future—5 to 20 years—is referred to as the National Model. This chapter includes a summary of both the State and National Models. These models are fully reported in separate project reports.[1]

The State Model

Introduction

The state modeling activities of the Analysis and Planning Project had a single objective: the development of a comprehensive set of procedures to support the planning of nursing requirements and resources one to five years into the future at state, regional, and national levels. A single, flexible, analytical model, supported by a common data base that is national in scope, was determined to be the best method for meeting the objective.

Because of the diversity of the states and the potentially conflicting views of interest groups and users of the State Model, it was recognized from the beginning that this was a most ambitious undertaking, involving substantial political and organizational problems as well as the technical ones. At the same time, however, project staff members at both WICHE and the Division of Nursing believed strongly that the potential value of the model warranted intensive efforts to ensure its successful development. Thus, a strategy was adopted that involved the substantive participation of planners, researchers, educators, consumers, and others in nursing and health care planning. The model was further developed through an extensive field development process, followed by pilot testing and refinement by the National Panel of Expert Consultants.

This section provides: (1) a brief overview of the model, (2) a review of its development, and (3) a description of the components of the requirements and resources planning process, including a panel to provide user judgments and the types of data to support the modeling effort and planning process.

Overview of the State Model

The term model can be defined as "almost always a mathematical, and necessarily an approximate, representation of reality. It must be formulated to capture the crux of the decisionmaking problem. At the same time, it must be sufficiently free of burdensome, minor detail to lend itself to finding an improved solution that is capable of implementation."[2] The State Model is an analytical process, supported by data where available, and by user estimates, assumptions, and criteria at key variable and decision points. By these means, projections are derived in a logical, systematic, sequential approach about requirements for nursing personnel one to five years into the future and the resources to be available.

The term requirements refers to the number of nursing personnel needed to meet the user's stipulated goals. The Requirements Projection Process consists of five major stages (See Fig. II.1.) that identify the key variables and decision points the user must address in making the requirements projection. These steps include:

1. Differentiating the client population
2. Examining health status indicators
3. Choosing realizable health goals
4. Developing a health strategy
5. Planning appropriate staffing patterns.[3]

The term resources refers to the actual number of nursing personnel expected to be available rather than the number qualified for employment. The Resource Projection Process includes the key factors that contribute to the increase and decrease in the number of nursing personnel and that must be considered in projecting resources to be available at a given point in time. Figure II.2 provides an overview of the resource projection scheme.

Figure II.1
Requirements Planning Process

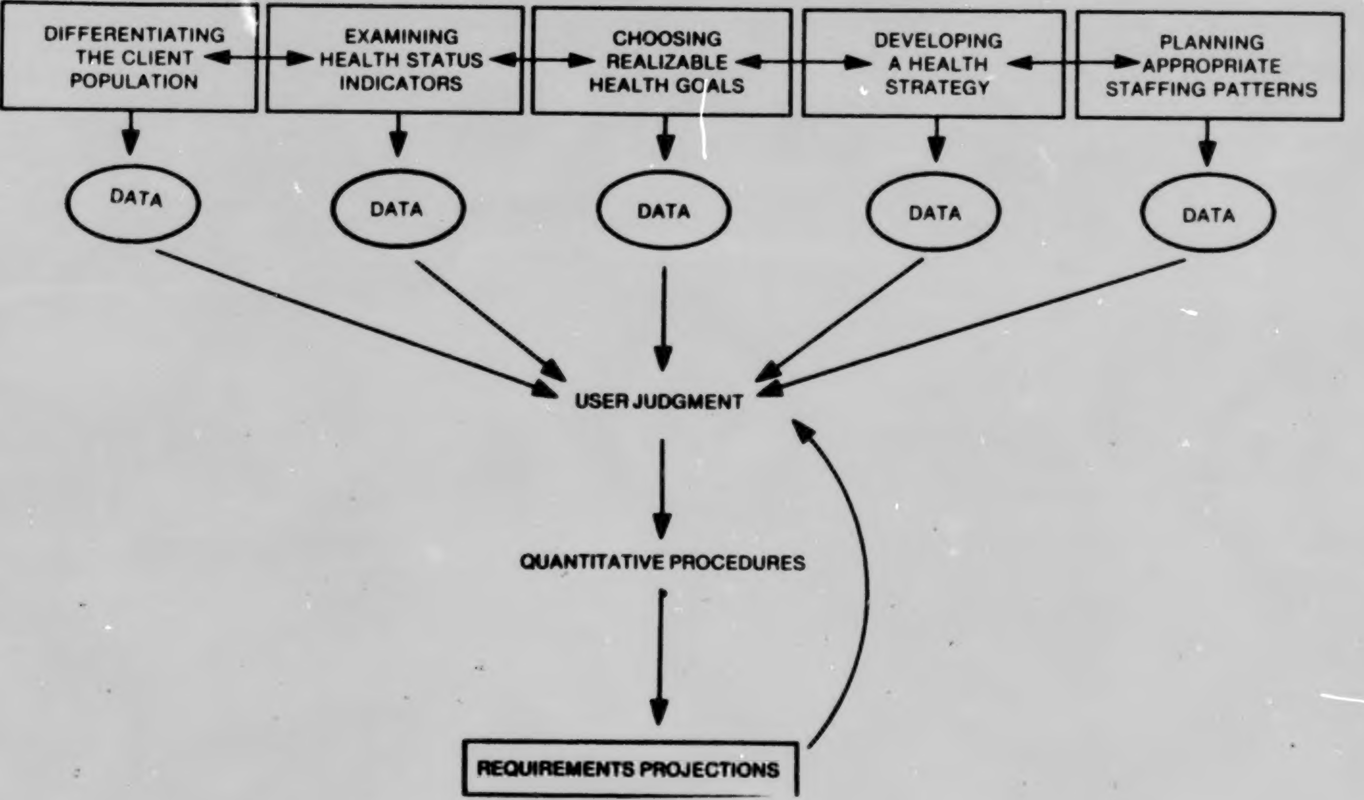
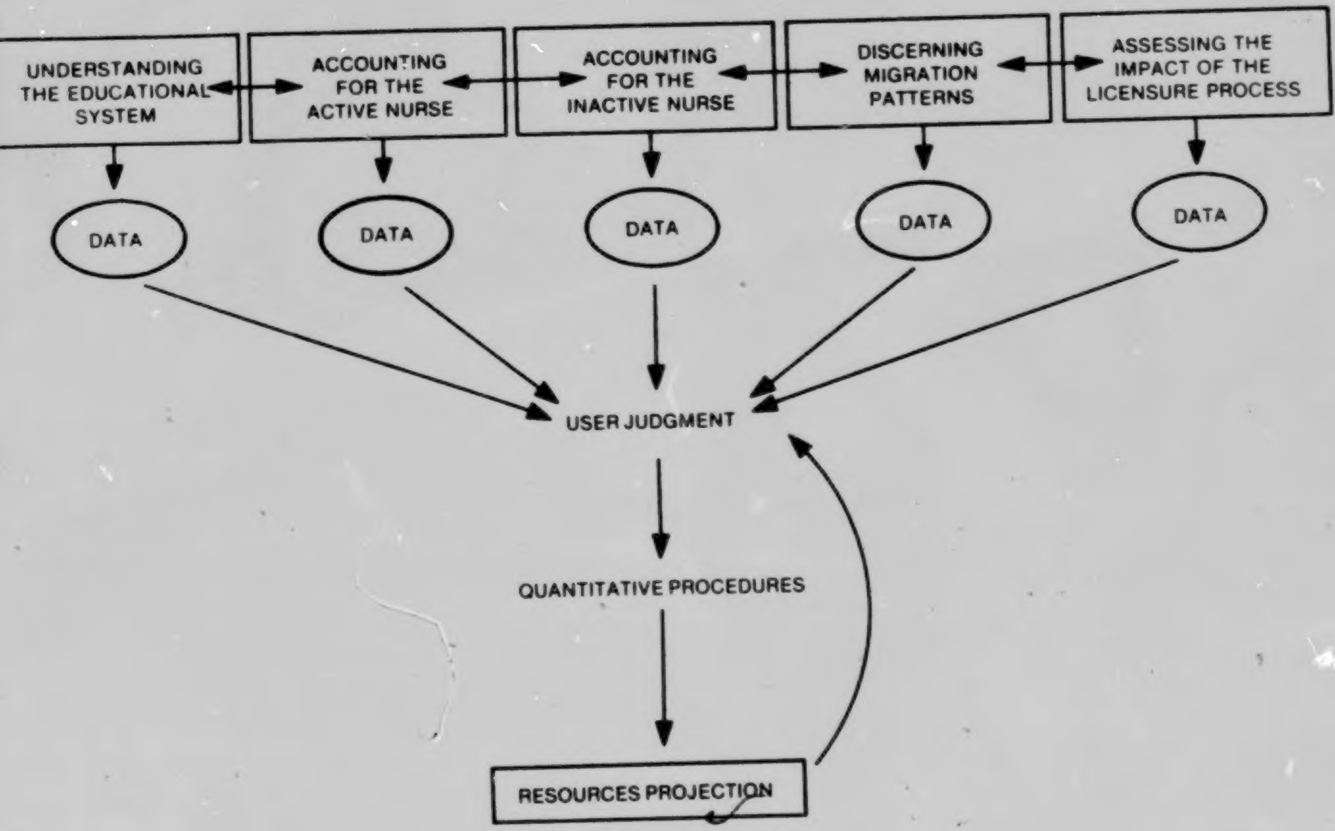

DIFFERENTIATING THE CLIENT POPULATION
EXAMINING HEALTH STATUS INDICATORS
CHOOSING REALIZABLE HEALTH GOALS
DEVELOPING A HEALTH STRATEGY
PLANNING APPROPRIATE STAFFING PATTERNS
DATA
DATA
DATA
DATA
DATA
USER JUDGMENT
QUANTITATIVE PROCEDURES
REQUIREMENTS PROJECTIONS

Figure II.2
Resources Planning Process


UNDERSTANDING THE EDUCATIONAL SYSTEM
ACCOUNTING FOR THE ACTIVE NURSE
ACCOUNTING FOR THE INACTIVE NURSE
DISCERNING MIGRATION PATTERNS
ASSESSING THE IMPACT OF THE LICENSURE PROCESS
DATA
DATA
DATA
DATA
DATA
USER JUDGMENT
QUANTITATIVE PROCEDURES
RESOURCES PROJECTION

In making projections, user judgement on the various decision points and data on the existing situation and results of trending are necessary. For the state modeling process, user is defined as a group of people representing at least the nursing profession, the postsecondary education community, and the health planning community. Factors to be considered in creating the user panel are discussed later.

The data to be reviewed by the user should be as comprehensive and current as possible. The profile reports developed under this contract serve as a point of departure. These reports were developed from data available for all states. It is recognized that a state may have more current data in some of the areas and that these data should be incorporated. The specific types of data needed to support each of the steps in the model are included in the more complete description of the model, which appears later in this section.

The document that provides a full description of the model is *Nursing Resources and Requirements: A Guide to State-level Planning*. State summary profile reports are available, as are users' manuals for the data base and report generation system.[6] To assist in the calculation of requirements and resources, users' manuals for the calculation software are also available.[7]

Developing the Model

The model was developed by the project staff with a great deal of involvement and participation from the State Model Task Force, representatives of the field development and pilot states, questions and suggestions from participants to the national conferences, and members of the National Panel of Expert Consultants (see Chapter VII for listing of participating groups).

The Task Force

The task force met seven times with the goal of developing a new methodology for projecting nursing requirements and resources. It was determined that a task force would work closely with staff, that the model developed would address new dimensions, would be realistic, and could be understood and utilized by nurses. The 12 task force members were chosen to be representative of nursing education, nursing service, the state licensure authority, state nurses' associations, comprehensive health planning, state higher education, and state health departments. Staff prepared and distributed materials to the task force members in advance of meetings. These materials were discussed and directions were set at the task force meetings. The task force and staff presented an early version of the model for discussion at the First National Conference. In addition, the version of the model incorporating results of the input from the First National Conference and of the field development was presented at the Second National Conference.

In summary, the task force provided the knowledge and guidance that led to the model as described in this section. The task force concluded its work by the end of the first 18 months of the contract, anticipating that the model would be widely used at state and substate levels.

The Field Development Process

In July 1975 a request-for-proposal to participate in the development of the State Model was issued to 45 organizations in 27 states. Criteria for the selection of the participant organizations included the nature of the nursing issues and problems addressed by the organization, its access to nurses and others directly affected by the nursing situation, the characteristics of nursing and health care in the state, the amount of previous involvement in planning, geographic distribution, size of population to be served, and the availability of staff and technical resources to support the activity.

Organizations in the five states ultimately were selected:

1. Illinois Board of Higher Education (with staff support and consultation from the Illinois Implementation Commission on Nursing)
2. Iowa State Office for Planning and Programming (Planning Division of the Office of the Governor)
3. Louisiana State Office of Comprehensive Health Planning (State Health Planning and Development Agency under P.L. 93-641)
4. University of New Mexico Health Sciences Center
5. Vermont State Nurses' Association.

The states represent a diversity of urban and rural health care problems, overall nursing shortages, deficiencies by skills and educational preparation, problems in the health care delivery system, special health needs of populations, and unemployment in nursing. Additionally, some substate areas in the five sample states exhibit health care characteristics similar to those of states outside the sample. Thus, overall, the five states represent much of the diversity in health care and nursing found across the country.

Each of the sponsoring agencies assembled a review panel to participate in field development activities within the state. For the five panels, a total of 87 individuals were appointed, including representatives from nursing service and education settings, professional organizations, state boards of nursing and higher education, health planning agencies, legislatures, and other groups involved in studies, data collection, and planning regarding nursing. Members included persons from urban, rural, and underserved areas; minorities; and planners, administrators, practitioners, and consumers with a variety of perspectives. An additional 22 staff members and consultants in the states contributed to the field development committees.

It was the responsibility of the state-level participants to review a preliminary set of planning tools for estimating nursing resources and requirements and to make substantive recommendations for improving their accuracy and utility. Each group was asked specifically to consider:

1. The kinds of nurse planning responsibilities that actually are assumed by different organizations in the state
2. The most likely perspectives of policy makers, planners, administrators, and consumers that will be brought to bear on information and decisions relevant to nursing
3. The ways in which state agencies may use or adapt procedures for nurse manpower planning
4. The resources that are needed and those that are available for agencies to use the products of the state modeling effort.

To lend additional reality to the field development activity, each committee was requested to proceed as if it were developing an actual statewide plan for nursing and to designate nurse planning areas for that purpose. The committees in Illinois and Louisiana selected the official health systems agency (HSA) areas (developed as P.L. 93-641 was implemented), modified slightly to include all counties lying within the state. Iowa, New Mexico, and Vermont adopted a different strategy, as all or most of these states lie within a single HSA. The Iowa committee selected five clusters of subareas that generally are used for state health planning. In New Mexico, counties of similar population size, regardless of their geographic location, were aggregated into four larger groups. The committee in Vermont described six geographic areas that appear to be natural clusters for health services.

The major activities of each state committee, working with the project staff, took place at two field development meetings held about three months apart. On both occasions, the committees reviewed and made recommendations for changes to draft documents (the *Guide* and user manuals) concerning the process of nurse planning, analytical procedures, and supporting data for estimating nursing requirements and resources.

The first field development meetings were intended to orient the panelists to methods being developed by the staff for making the estimations and to familiarize them with the data available at that time. The initial versions of data and the computer programs for calculating nurse requirements were given to three state agencies for testing the adaptability of software to the computer services the agencies had available. (One of the remaining agencies did not have access to computer services, and the facilities of the other were not designed to translate the language that was employed—FORTRAN IV.) At the second meetings held three months later, the panelists reviewed changes in the estimating procedures, assumptions, and data sources, and discussed the potential usefulness and limitations of the models under development.

The state panels agreed throughout their work with project staff that the State Model can provide kinds of information about nursing requirements and resources that has not been available. At the same time, they articulated some common concerns that called for careful attention in the further development and testing of the model:

- That the logical and basic steps in the nurse planning process should be described; estimating procedures would then be seen in the proper perspective
- That there is no satisfactory standard for estimating the need for nurses; therefore, the determination of nurse requirements would require knowledge of the character of the state and judgment on the part of the users
- That the estimation of nurse requirements should include specific attention to demographic characteristices and health status of the population to be served, the expected mix and use of health services, and staffing needs in particular nursing services
- That there is a need to highlight current shortages of nurses to provide services in rural areas, inner cities, and low-income and minority group communities
- That quality of care also should be addressed in determining nurse requirements
- That the most current, reliable data should be used wherever possible; the data base will need to be updated as new data become available after the contract period is over.

Each state group prepared a report summarizing health care problems and nursing issues in the state and appraising the file development experience and potential utility of the products of the state modeling activities. These reports are contained in *The Field Development Component of the State Modeling Activities Final Report*, published in February 1977.[a]

Pilot Testing the State Model

Field development of the State Model was completed in September 1976, concurrent with the end of WICHE's initial contract with the Division of Nursing. A field review edition of the *Guide for State-Level Planning* had been produced, along with a computerized data base and supporting software for implementation of the procedures in the guide. At this point, WICHE was requested by the Division of Nursing to provide additional assistance in activities relating to its 1978 Report to Congress. A one-year extension was written to the original contract, with funds available for two purposes: to conduct a formal pilot test of the State Model, and to convene a panel of expert consultants that would work to produce national and state-by-state estimates of nursing manpower resources and requirements five years into the future, using the State Model process. The report of the Panel of Expert Consultants is found in Chapter VI.

An invitation to take part in the pilot testing was issued by WICHE to all states that had contributed formally to the field development of the State Model; three of them accepted (Iowa, Louisiana, and New Mexico). The additional three states were selected for participation on the basis of the added diversity of size, complexity, and geographical representation they would bring to the sample—New York, Rhode Island, and Washington. Mississippi and Colorado elected to be observer states. Mississippi then conducted a nursing study on its own using the State Model planning process. A Colorado study was later carried out under contract with the Colorado Commission on Higher Education.

Three products were to be used in the pilot testing.

1. *Nursing Resources and Requirements: A Guide for State-Level Planning* (Draft Version)
2. A computerized data base with supporting software to access the data
3. A technical document describing the data base and computer software.

The purpose of the pilot was to review thoroughly and use these products under actual conditions so that they might be improved before release in final form. It was intended that the pilot test states also would benefit through improvement of their planning efforts, and that the Division of Nursing would receive useful state-generated data relevant to its 1978 Report to Congress.

Pilot test activities were planned for a seven-month period, December 1976 through June 1977. Four meetings of participants from the states were held in the Denver-Boulder area for review and explanation of procedures outlined in the *Guide*. Most of the effort, however, took place in the states themselves and consisted of three kinds of activity.

1. In-state staff work, directed, for example, toward the development of goals and strategies for health planning, and toward the formulation of quantitative projections of nursing resources and requirements
2. In-state computer runs, designed to test the model's data base and software on the state's computer system
3. Preparation of a final report, to include documentation of the pilot testing process and numerical projections of nursing requirements and resources for the state.

In retrospect it became evident that an omission in the pilot testing plan was the lack of a requirement that a state-level advisory group be convened to participate in the pilot test activities. Despite the omission, most of the states voluntarily elected to establish such a group. Each state's report provided a general and technical evaluation of the products, an evaluation of the planning process, a set of assumptions used in the modeling effort and projections resulting from it, and outcomes and recommendations concerning the model. Some general statements from the pilot test states can be summarized regarding the components of the State Model and the planning process itself.

- There is implicit strong support for the use of mathematical modeling procedures to conduct studies and make projections of nursing manpower resources and requirements. One state summed up its experience by reporting: "This study will provide what others have not—concrete numbers and a clear direction for the *kinds* of nurses needed."
- The *Guide* itself received high praise for its clarity, comprehensiveness, and flexibility. It was regarded generally as an absolutely essential component of the model. As one report stated, "It *is* the model."
- The data base and profile reports were seen as useful but generally not essential. Not surprisingly, as the model's data base was taken from national sources, it was found that in-state data available in many cases were more accurate than those from the project data base.
- Some participants pointed out that, although the *Guide* is designed for analysis of nursing resources and requirements, the planning process described easily could be adapted, with great potential benefit, for other health manpower planning needs.
- Finally, the context in which the state modeling products are used must be established carefully, especially with respect to the use of advisory groups, which must include nursing experts in conducting state applications of the model. Such groups are considered essential to the process of making assumptions for input to the model; they serve additionally to lend credibility to the results of the planning efforts among nurses and in the larger health care community.

National Panel of Expert Consultants

The National Panel of Expert Consultants utilized the same draft version of the *Guide* and the profile reports in its deliberations. The panel stated that the model is a significant guide for making requirements projections at state, substate, and national levels, and strongly urged states to carry out their own studies.

The panel derived assumptions, estimates, and criteria to project state-by-state nursing requirements from a national perspective. These assumptions, estimates, and criteria can serve as a point of departure for any group undertaking a nursing study. The panel's decisions are fully documented in Chapter VI of this report. The panel developed a new method of calculating the need for community health nurses. This methodology is fully described in the panel's *Report* and has been incorporated into the *Guide*.

The panel did make some variations from the approach described in the *Guide* in the calculation of the numbers of clinical specialists, nurse practitioners, researchers, instructors and consultants, and school administrators. These variations affect the way the number of nurses are projected but *not* the total number projected. The *Guide* discusses these variations in detail.

The panel, recognizing that the data base is essential in planning, also recommended that resources be provided to allow for continued data collection to develop a sound and significant data base for future projections at state and national levels.

Summary

The model as described in some detail in the next part of this section and in greater detail in the *Guide* is the result of the advice of many individuals and of the national conferences, field development, pilot testing, and use by the National Panel of Expert Consultants. It provides an important and tested approach for planning and decision making. Others who use it may make further refinements—the data will need to be refined and updated with data as they become available.

The State Model Process

As previously stated, the State Model is an analytical process, supported by data where available and by user estimates, assumptions, and criteria at key variable and decision points, by means of which projections are derived in a logical, systematic, and sequential approach about the requirements for nursing personnel one to five years into the future and the resources to be available. The following provides more detailed information on the requirements and resources planning process, including the types of data and the recommended composition of the panel to provide the user estimates, assumptions, and criteria.

Requirements Planning Process

The requirements planning process is depicted in Figure II.1. It consists of five major steps that identify the key variables and decision points the user must address in making projections for the numbers of nursing personnel required to meet health goals for population groupings. These steps are:

1. Differentiating the client population
2. Examining health status indicators
3. Choosing realizable health goals
4. Developing a health strategy
5. Planning appropriate staffing patterns.

A description of each of these steps, the rationale for inclusion, and the types of data to support decision making follow.

1. Differentiating the Client Population

The first decision point in the model is to differentiate the client population within the defined geographic location (nation, region, state, or substate). Differentiating the population provides greater insights into the health needs of the population and the kinds of facilities, services, and personnel required. This is derived from the knowledge that different population subgroups often have very different health needs. Thus, a health care delivery system primarily serving the health needs of the aged or poor should be constituted differently from a delivery system serving the health needs of a younger or affluent population.

There are two other reasons for differentiating the population and for making this the first step in the requirements-analysis process. First, there is the problem of unmet health needs. Looking only at previous health service utilization rates tends to obscure the serious, unmet health needs of people who never utilize particular health services because of cost or physical inconvenience. Planning approaches that do not adequately address the question of unmet health needs are seriously deficient and tend to perpetuate the status quo in terms of whose needs are met or unmet. For this reason, the requirements analysis approach begins with the total population figures and the population subgroups and then proceeds to analyze the health needs of the population, whether met or unmet.

Second, beginning with an analysis of the various population subgroups provides a better opportunity for delivering health care in more innovative ways. Analyses that begin with the health care delivery system as it has existed tend to dampen discussions of how the system might be restructured to provide quality care more effectively at less cost. If one begins with a detailed treatment of the health needs of the client population, it is much easier to consider alternative health care delivery systems. It should be added that having a diverse set of alternatives from which to choose is a key element in effective planning.

Therefore, it is important, in making decisions regarding the population, that consideration be given to: (1) the total population to be served; (2) the demographic characteristics (such as age and sex) of the population

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that help to establish the subgroupings to be considered; and (3) the educational attainment, economic status, and occupational data for the population groupings.

2. Examining Health Status Indicators (Identifying Health Needs)

The next decision point relates to assessing the health status of the population subgroups within a given geographic location. A health status indicator is defined as a quantitative measure that directly or indirectly reflects on the health of a given population. Quantitative measures, health status indicators that *directly* reflect on the population's health, are meant to include morbidity/mortality rates, which usually are expressed in terms of morbidity/mortality episodes per 100,000 people. Health status indicators that *indirectly* reflect on the population's health would include environmental data on pollutants having a deleterious effect on health. The most commonly used definition of health is given by the World Health Organization (WHO): "Health is a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity."[1]

Health status indicators, like social indicators in general, have three major purposes or functions: assessment, anticipation, and monitoring or tracking. Health status indicators serve an *assessment* function in that they can be used to answer the question, How healthy or unhealthy is the population? Assessment usually is associated with comparing data from one state with data from other states. The *anticipation* function is concerned with how health status indicators might be changing, with the idea that if we can foretell what health problems will exist in the future, we can better plan for the type of health care delivery system that can meet future health needs. Finally, health status indicators serve a *monitoring or tracking* function in that the indicators can be monitored now, so that two, three, or four years from now it will be possible to evaluate how effectively health programs have been in meeting their objectives. As a result of the data analysis on the population and on the health status indicators for the population, the user can determine the health needs.

3. Choosing Realizable Health Goals

Once the health needs of the community are defined, goals can be established to assist in planning. The health goals should be identified and priorities in meeting the goals established. In identifying goals, a review of goals established at national, state, or local levels may assist in goal formulation. The goals need to be specifically stated to allow for effective planning and later to evaluate the extent to which the goals have been met.

The goals serve as a guide in making decisions regarding the type of system and the changes within the present system that are needed. This goal setting and the priority determination can assist in resource allocation. It is important to set goals that not only will improve the health of the population but are also consistent with the resources and capabilities of health science. Health program goals must be viewed in terms of all types of societal goals. The determination of health goals sets the stage for determining goals for health programs, health services, and health personnel.

Although quantitative data on health goals are limited, the user may want to review: (1) national priorities as listed in federal legislation, and (2) priorities established by some area planning groups and state-level organizations.

4. Developing a Health Strategy—Health Care Programs and Services

Once goals are established to meet the health needs of the community, strategies to implement the overall health programs and specific services to meet the goals are needed.

Within a health care delivery system, a number of health care programs should be offered. The identification of programs sets the stage for what the health system should look like. Collectively programs should provide the services needed in a coordinated, effective manner. Determination of health programs can serve as a general scheme for categorizing health care services. Various approaches to categorizing programs have been proposed. One example is to describe health care programs as primary, secondary, and tertiary care. Such descriptions of programs do not specify the institutional setting but rather set the framework for providing services, some of which are provided in traditional institutional settings.

The services are components of the health care programs. Through the identification of services, a more detailed version of the strategies to meet the health goals of the population is made. Examples of services provided in an ambulatory health program include: outpatient clinic visits, community health visits, and school nurse visits. Hospitals can be classified by size of institution and by major types of care provided. Within hospitals various services may be provided, for example, intensive care, self-care, and psychiatric care. Other services might include surgical operations, emergency visits, and home health visits.

In determining services, the user will want to consider the services that are needed to meet the goals. Based on an understanding of trends and future emphases in health care, decisions will be made that some services may increase or decrease, some new ones may emerge, and some existing ones phase out.

The determination of the use of facilities (e.g., occupancy rates in various hospitals, number of visits, operations) needs to be made. Existing patterns and trends provide the basis for such determinations.

In additon to determining the health programs and services that provide direct care to the population, consideration must be given to the types of health-related organizations that affect both health care and the education of health providers and to the educational programs that prepare the various types of health personnel. Again, trends and the overall goals for the future assist in determining the types and size of health-related organizations and the types of educational programs and enrollments in each.

5. Planning Appropriate Staffing Patterns

The fifth decision point in the requirements process is to determine staffing patterns for the various health services identified. For each service, decisions must be made regarding the numbers of registered nurses (RNs) needed to a specific factor (such as patients, client visits, students and institutions) and the educational preparation of the registered nurses for the various positions. For those services in which licensed practical nurses (LPNs) and aides can effectively and safely participate, the numbers of licensed practical nurses and aides need to be specified.

In determining the staffing patterns for direct client care in various health services, consideration must be given to factors such as the acuity of care of patients, the amount of time needed for clients' visits, and travel.

For direct care providers (staff positions, clinical specialists, nurse practitioners), the number of registered nurses per 100 patients by type of service units are determined. For private duty, a number-per-population figure can be set. Criteria for administrators, researchers, consultants, and inservice instructors are determined by considering the size of the institution and/or the numbers of staff one person can supervise.

A new approach to determining staffing requirements for community health nursing was developed, which is described in detail in an internal appendix (Appendix D) in Chapter VI, the Report of the National Panel of Expert Consultants.

For educational programs that prepare nursing personnel, staffing patterns that include administration and faculty per type of program must be identified. Faculty-student ratios based on the type of program should be stated.

For health-related organizations, the numbers and types of organizations determine the staffing numbers and educational preparation. These criteria may be based on registered nurses per population.

The Planning Process for Making the Requirements Projection

To make the requirements projections, for any given period of time, a panel must make decisions on the various key variables as identified in the State Model. These key variables are related to the population, health needs, goals, programs and services, and staffing patterns to provide the level of nursing care required by the population groupings.

To assist the panel in making its decision leading to the requirements projection, data are needed. The national profile reports in the *Guide* are the types of reports that are available at the state level.

In addition to these reports and the other information in the *Guide,* assumptions, estimates, and criteria developed by the National Panel of Expert Consultants may be used as a point of departure. The computer runs using the National Panel of Expert Consultants' lower bound and upper bound criteria with state-specific data also provide a base for making decisions. The data assembled during the Analysis and Planning Project, the data available within the state that may be more current and complete, and the collective consideration of the panel members will ensure the type of decisions essential to sound planning.

Resources Planning Process

As a total part of the planning process, it is important to determine the current and projected supply of nursing personnel. These projections of nursing resources, however, are not influenced by estimates of nursing requirements. When the requirements projections and the resources projections are compared, problems of distribution become evident. Recommendations to correct the problems can then be made.

The resources planning process is depicted in Figure II.2. In making the resources projections, data and judgments are needed on the following five major areas: (1) the educational system, (2) the active nurse, (3) the inactive nurse, (4) migration patterns, and (5) the impact of licensure process.

The *Guide* includes background material and related profile data reports on the above five areas. The content in the *Guide* will assist in understanding the issues and factors that affect nursing supply. Following is a brief description of the content included in the *Guide* for each of these areas.

1. Understanding the Educational System

Nursing education from the standpoint of adding to and renewing nursing resources within the states is discussed. All nursing education programs are considered: basic programs preparing the student to sit for the registered nurse licensing examination; a variety of post-RN programs, including post-RN programs leading to the baccalaureate degree, higher education programs leading to a master's or doctoral degree, and continuing education programs; and programs preparing students to sit for the practical nurse licensing examination. A number of important planning issues, such as equality of access and the costs associated with these programs, are touched upon in these chapters. Additional planning considerations are raised during the course of treating fundamental indicators of the postsecondary educational system, such as the number of programs, admissions, enrollments, and graduations. Profile reports present the kind of data that would be useful for supporting informed discussions of these topics. Included in the profile reports are data on the number of nursing programs and race/ethnicity information on admissions, enrollments, and graduations.

2. Accounting for the Active Nurse

Although the educational system supplies a needed source of newly prepared nursing personnel, the number of graduates is a relatively small group of nurses compared to the number of actively employed registered nurses. For this reason, considerable attention must be given to the registered nurses who constitute the active work force. A number of key dimensions for analyzing the active supply of registered nurses, including employment setting, position, education preparation, and age are discussed. The profile reports display the kind of data that would support a thorough analysis of these dimensions.

3. Accounting for the Inactive Nurse

Another important aspect of the resources planning process is consideration of the number of nurses not currently working in nursing. A number of key policy questions are related to this aspect of the resources planning process: Why are these nurses inactive? Do inactive nurses represent a potential resource available to the health care delivery system? Why do newly graduated nurses become inactive?

4. Discerning Migration Patterns

Another difficult area in nursing resources is the migration of nurses into and out of a state. A number of factors that may shed light on their migration are discussed in the *Guide*.

5. Assessing the Impact of the Licensure Process

In one way or another, nurses discussed under previous headings—either as new graduates who became licensed active nurses, inactive nurses, or nurses who migrate from one state to the next—are affected by the licensure process. In the sense that all nurses must go through the licensure process to practice, the content oriented to licensure serves to integrate the previous four areas dealing with nursing resources.

The Planning Process for Making the Resource Projections

In making the resources projections, the factors that add to the supply (graduation, return to the active labor force, migration) and the factors that subtract from the supply (change to inactive status, retirement, death, and outmigration) must be considered.

The comprehensive registered nursing resources flow model appears in Fig. II.3. This model reflects the major areas discussed previously. A similar model for licensed practical nurses can be used. The major change would be in the area of education, which would be only enrollments and graduations from licensed practical nurse programs, as there is only the one level of preparation.

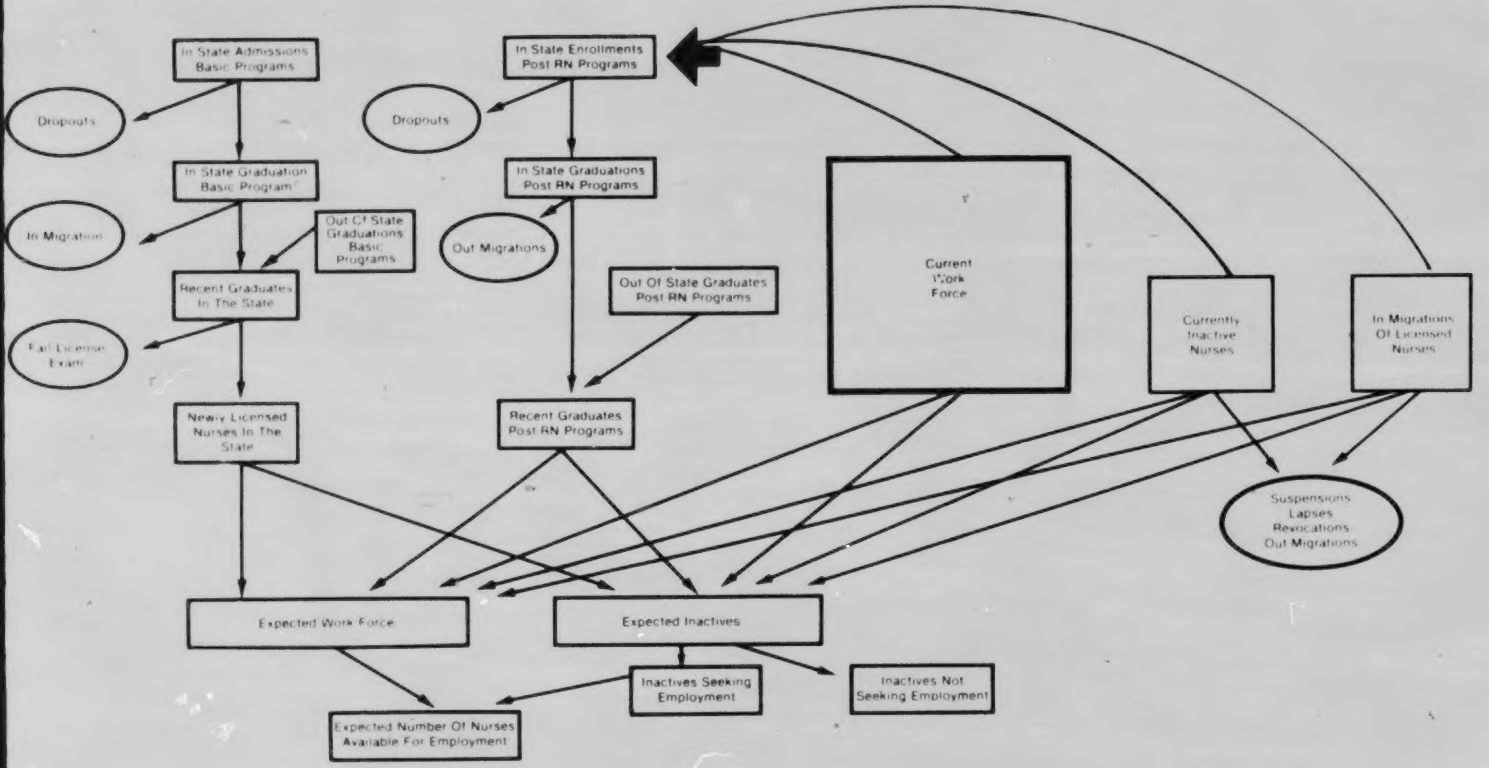
To generate the resources projections, data on the admissions, graduations, and migration patterns and data on active and inactive nurses both newly graduated and currently licensed are needed. These data, along with an understanding of the licensing process, aid in making the projections. The user will use the data and make assumptions to provide the resource projections.

Panel to Make User Judgments

An essential aspect of the model is that a group of individuals must be convened to collectively provide the judgments on the assumptions, estimates, and criteria for the components of the requirements and resources planning process. The panel should include individuals having a knowledge of trends in health care projection techniques and data sources. In forming the panel, consideration should be given to those individuals and organizations that influence health care and planning.

At least three major groups should be included in any planning effort: the nursing profession, the postsecondary education community, and the health planning community. Examples of representatives from the nursing profession would include nursing service administrators from hospitals, nursing homes, and community health agencies; nursing faculty; state nurses' association and regulatory bodies; and nurses in direct practice. Those from the postsecondary community might include members or staff from the state coordinating/governing board, university administrators, and nursing school deans. The health planning community might be representated by state health department officials, hospital administrators, health economists, and staff from the various P.L. 93-641 agencies. Demographic factors (such as racial/ethnic

Figure II.3
A Comprehensive Nursing Resources Flow Model


In State Admissions Basic Programs
Dropouts
In State Graduation Basic Program
In Migration
Out Of State Graduations Basic Programs
Recent Graduates In The State
Fail License Exam
Newly Licensed Nurses In The State
In State Enrollments Post RN Programs
Dropouts
In State Graduations Post RN Programs
Out Migrations
Out Of State Graduates Post RN Programs
Recent Graduates Post RN Programs
Current Work Force
Currently Inactive Nurses
In Migrations Of Licensed Nurses
Suspensions Lapses Revocations Out Migrations
Expected Work Force
Expected Inactives
Inactives Seeking Employment
Inactives Not Seeking Employment
Expected Number Of Nurses Available For Employment

identity and urban/rural representation) should be reflected in the group.

A panel's composition, then, should include representatives from various groups, all concerned with health care, education, and planning, but who may have differing views on such aspects as specific goals, services, and staffing. Through the face-to-face contact in panel meetings, interchange can occur. A panel has the potential of developing into a working group in which legitimate biases and preferences can be openly stated and clearly understood by all. Such frank and common understanding is the necessary precursor to compromise and consensus building, crucial if a plan is to be developed that is acceptable to all parties and that will serve as the basis for future planning.

Data

The data to be reviewed by the panel should be as comprehensive and current as possible. The 54 profile reports prepared at the national level and for each state contain information specifically useful to the State Model planning groups. The five major subject areas covered by the reports are: (1) the social and economic characteristics of the population; (2) the health needs/health status of the population; (3) facilities and services within the health care delivery system; (4) nursing personnel—registered nurses, licensed practical nurses, and aides; and (5) nursing education and licensure statistics. The development, use, and limitations of these reports are more fully described in Chapter III.

In addition to the profile reports, the state runs based on the Panel of Expert Consultants' work, which contain background data from the data base and the assumptions, estimates, and criteria determined by the panel, are available. State-specific data on population, numbers of health facilities and services, schools of nursing, and utilization of services (e.g., occupancy rates) were used in generating these reports. For each state, runs using the lower bound and upper bound criteria were made. The reports contain the same type of information at the state level that is in the *Panel of Expert Consultants: Final Report* for the nation. (See Chapter VI, Internal Appendix B.) States may have more current data in some areas than that which is included in the profile reports. These data should be incorporated and used by the panel in making its projections.

Implementing the State Model

When an organization within a state decides to implement the State Model° process to plan for nursing, a number of important steps should be taken. This section identifies the major points that the project staff recommends, based on its experiences in using the model with various groups.

Sponsoring Agency

The sponsoring agency may be the state nurses' association, a postsecondary higher education agency, or a state health planning group. It is imperative that the agency have a full and complete understanding of what the model does and does not do. Only if the purpose is to determine requirements for nursing personnel should the State Model be used. If, for example, the agency wants a supply and demand model, the State Model should *not* be used.

It is strongly recommended that the state nurses' association, although not always the sponsoring agency, take responsibility for coordination and implementation of state planning for nursing.

Representation on the Panel

A panel of consultants representing various groups must be convened. The panel's decisions should serve as the basis for the projections and any recommendations for action. Without a representative panel the results may be questioned. It is important to have a panel small enough to work effectively, yet large enough to ensure obtaining the appropriate information. A group of 20 to 25 members has proved to be workable and representative.

As stated previously, at least three major groups—the nursing profession, the postsecondary education community, and the health planning community—must be included. In addition, consideration should be given to including representation from the legislative and executive arms of the government, the medical profession, and the nursing home associations. The panel should collectively reflect the health care system and the nursing education system in the state.

The individuals selected to represent the identified groups should have the expertise needed to address the problems of planning for health care. Because the projections are for nursing, the majority of representatives should be nurses. It is important to have nurse administrators from hospitals, nursing homes, and community health services. Direct client care providers must be represented. A representative from each type of nursing education program should serve on the panel; the state board of nursing and the state nurses' association should be represented.

From the health planning community, representation should be considered from the state and each HSA planning group. The panel members must also reflect the geography of the state and the various ethnic minority populations.

The panel members need to understand the charge to the group, the approach to be used, what the models will and will not do, and the amount of time involved in the process.

Level of Projections—State/Substate

An early decision required is the level of the projections to be made. Depending upon the purpose of the application of the model, the decision may be to project requirements and resources at the state level only or at a substate level, e.g., county, HSA, or clusters of counties. A state-level only study is important in planning but will not reflect the distributional problems that may exist in substate areas.

If the decision is to do state-level and substate-level projections, it is necessary to have data at these levels of detail. For example, it is important to project population growth rates, facilities, and nursing resources specific to each substate area. When data on requirements and resources are compared among the substate areas and with the state as a whole, specific substate distribution problems become very evident.

Meetings

The number of panel meetings will depend on the charge to the panel. Four to six days of meetings are necessary to orient the panel to the objectives of the study and the model itself, and to make the necessary assumptions, estimates, and criteria for each component of the model. If the panel is to make recommendations based on the projections of requirements and resources in such areas as educational programs and ways to improve delivery, at least two additional meetings may be necessary.

Besides the meetings of the panel as a whole, ad hoc groups may be convened. For example, it may be advantageous to have a small group review criteria for staffing of nursing homes. For such groups, some members of the panel and others concerned with that area may meet and propose staffing criteria for the panel's consideration. Ad hoc groups may be considered for any part of the process, e.g., numbers of hospitals projected for the future, criteria for administrators, and criteria for staffing small hospitals. For these ad hoc groups, it may be helpful to obtain data on the present and projected staffing patterns from a sample of institutions. Contacting others not on the panel serves two important functions. It provides more information on the panel's deliberation and makes more people feel a part of the study.

The panel meetings should provide open discussion in which various points of view are expressed. There will be areas of disagreement. The decisions should be based on consensus to the maximum extent achievable. If a panel member does not agree with the major conclusions, the opportunity for a dissenting view that includes the rationale should be made. Such dissenting views, if any, should be included in the report.

To assist the panel in its deliberations, project staff must provide needed materials prior to each meeting. Detailed agenda, drafts of materials, computer runs based on previous panel decisions, and reports of ad hoc groups should be sent prior to the meeting date. Detailed minutes of each meeting are necessary. These can provide documentation for the final report.

Data for the Panel's Deliberations

The state summary profile reports and the requirements projections based on the Panel of Expert Consultants should be reviewed by the panel members. Again, the panel should note that the data in the profile reports are only as recent as 1975 and contain certain inaccuracies. There are deficiencies in the data. More current and accurate data that may be available from the state board of nursing, state health department, and other agencies, should be obtained and used in conjunction with the profile reports.

The requirements projections based on the National Panel of Expert Consultants are based on state-specific data on the numbers of service facilities and schools of nursing, utilization of services, and enrollments as of 1973 or 1975. The population figures for 1974 and 1982 are derived basically from Bureau of the Census data for the state. The requirements for 1982 are based on the National Panel's assumption, estimates, and criteria. In reviewing these data, a given state panel can assess which of the assumptions, estimates, and criteria are applicable to its state.

Examples of specific questions that should be addressed are:

- Regarding population:
  1. Are the population figures consistent with recent trends in the state? For example, has there been or will there be an influx of people in the childbearing years because of new industries that will increase the birth rate above that which had been projected?
  2. If projections are being made at a substate level, what is the projected population for each of the substate areas? The rate of growth for each area may be different.
- Regarding health needs:
  1. Are there any major environmental factors affecting health in the state (e.g., asbestos factories, coal mining, nuclear power facilities)?
  2. Given a specific minority population, what health care indicators need to be addressed (e.g., if a Black population—high blood pressure, sickle cell anemia)?
- Regarding goals:
  1. What goals have been stated at state or local levels?
  2. What goals have the highest priority?

- Regarding programs and services:
  1. What are the numbers of hospitals and nursing homes projected for the future? Are the numbers projected by the National Panel consistent with trends and needs? In what substate areas will the facilities be opened, merged, or closed?
  2. Will the present occupancy rate for various types of units and agencies (1975) be maintained in the future or will some rates increase or decrease?
  3. Is the percentage of patients discharged from hospitals and the number of visits per person per year consistent with state data and expected needs?
  4. Are the data regarding high-risk groups consistent with state data?
- Regarding staffing criteria:
  1. How do the National Panel's criteria meet the state's desired level of care? (It should be stressed that the National Panel did not establish these criteria as standards; it emphasized that many states may aim to meet or exceed the upper bound criteria.)
  2. Is the standard of 1,800 working hours per year per one full-time employee consistent with the working hours in the state?
  3. Does the number of visits a nurse can make per day consistent with travel time and other factors in the state?
  4. Are the criteria for educational preparation for all fields consistent with such factors as state needs and standards? For example, does the state require a master's degree in nursing for faculty in all nursing education programs?

In projecting the requirements for nurse faculty, the numbers of programs by type of program and the numbers of students enrolled need to be considered. The data in the National Panel's runs are based on national trends applied to state-specific data on the types of programs already existing. For example, if a state did not have a master's or doctoral degree program, there was no projection for establishment of such a program. Data on new programs should be obtained and numbers of such programs and enrollments built into the calculations. Enrollment data on all programs should be verified and updated by contact with the schools or the state agencies that collect such data. It is important to obtain data on the numbers of graduations anticipated from each program.

When the data from the 1977 *RN Inventory* are available, these data can be used to update information such as the percentage of nurses who work full time or part time in all settings. The *RN Inventory* will also provide data that have been lacking in the past, for example, the ethnic background of nurses and the numbers of nurses prepared as clinical specialists and practitioners, as well as more information on the inactive nurse. The *RN Inventory* data will provide much of the information needed to view the current scene and to project forward.

Ensuing Recommendations for Education Programs and Health Care Delivery

If the panel is charged with making specific recommendations and/or a plan of action to meet the needs of the state, it is helpful to have subcommittees meet to discuss defined areas and then report back to the total panel. A rating tool can be developed to assist the panel members in determining priorities.

Report of the Panel

The final report should contain the essence of the panel's deliberations and the decisions and the resulting requirements and resources projections. Analysis of these data may include the extent to which the state and/or substate areas will meet the numbers of nursing personnel and the numbers of registered nurses by educational preparation and the comparison of the panel's work with the projections made by others. If such comparisons are made, the major reasons for the differences should be explained. Drafts of the report should be reviewed by the panel to ensure that it reflects the work of the group.

Distribution of the Panel's Work

A decision must be made early regarding at what point the panel's work will be shared with others. Some groups may decide not to release any data until the final results are available. If this decision is made, others may view the deliberations as being too closed. If, however, data are shared during the working period, it must be clear that the data are preliminary and subject to change.

Once the report is completed, copies should be available to all groups involved in health planning, even those not directly represented on the panel. If sufficient copies cannot be made, notifications of where copies are available for review should be sent.

Follow Up

It may be advantageous to have presentations and/or workshops/conferences on the panel's work. Through such activities, the work of the panel can be better understood and the extent to which the projections meet the health care needs of the state can be explained.

Staff for the Project

The size of the state and the scope of the project will determine the size of the staff needed. The staff will need to consist of at least one well prepared registered nurse, one computer programmer, and a secretary. Research assistants can gather data and carry out some computer activities.

Length of Project

Experience to date suggests that a statewide application of the model will take 9 to 12 months. This amount of time is needed to organize the panel, update information and data, hold the necessary meetings, and provide staff with the time between meetings to prepare materials for the panel's deliberation and follow up the panel's work, in addition to writing the final report.

Budget

A dollar figure is difficult to specify. Money should be budgeted for personnel; travel and per diem expenses for staff for panel meetings, ad hoc group meetings, and visits to state agencies as necessary; panel members' travel and per diem expenses, as well as consultant fees if paid (some states may ask panel members to serve without compensation); computer costs; duplication costs for materials for the panel's deliberation; drafts of the final report; mailing costs for the panel's materials; requests for information and telephone calls to obtain information; and costs for final report, editing, duplication, and mailing. A plan is needed for responding to requests for information about the project during and after its completion.

The National Model

Introduction

The National Model [10] uses a set of techniques known as system dynamics. The model is concerned with changes taking place and likely to take place in nursing and in health care generally. It focuses on the impact those changes will have on the supply, demand, and distribution of nursing personnel and services. The model is being developed as a tool for policy makers, those who make policy through formal governmental processes, and those who make policy informally through the leadership they exert in nursing service and nursing education. It enables those policy makers to pose questions and receive assistance in answering "what if?" questions about actions, programs, and policies they are considering implementing. Such questions may pertain to effects of changes in nursing, such as movement toward increased numbers of associate degree and baccalaureate graduates, more nurses covered by collective bargaining agreements, new roles for registered nurses, and efforts to achieve better geographic distribution of nurses. Questions may also pertain to effects of changes in the health care system, such as increases in demand due to a national health insurance program, shifts in task responsibilities among different types of health care personnel, increased pressures to control health care costs, and shifts in health care delivery from institutional to community settings. To apply the model at the state or regional level, modification in the model is required.

The Model Development Process

The National Model has been developed with the active involvement of a task force that includes representatives of nursing service, nursing education, higher education, comprehensive health planning, the Division of Nursing, and project staff. (See Chapter VII for listing of task force members.) The involvement of this task force was an essential part of the model's development, because task force members provided direction that assured the model would be an accurate representation of the nursing and health care systems and that it could address salient policy issues.

Task force members were responsible for enumerating the set of factors contained in the model and acted as a sounding board through the development of several tentative formulations until an acceptable model structure was achieved. A wide variety of data sources out of the Analysis and Planning Project data base were then used by the Pugh-Roberts consultants to verify the model's cause-and-effect relationships to quantify those relationships. Data that characterized nursing employment and education at any point (numbers of nurses employed in each setting or enrollments in nursing programs) were generally available from published ANA and Division of Nursing sources. However, data describing the effects that cause changes to occur in numbers of nurses employed and being educated between one point in time and the next were not readily available.

Task force members were the principal source of data by filling out and discussing questionnaires covering many of the model's relationships. Though these data were "soft" (based on informed estimates rather than on a survey), a careful search of nursing literature and discussions with experts on nursing data revealed that these were the only data available on certain of the model's relationships. Following a thrust central to the system dynamics approach, these data were used in the model, rather than disregarding relationships the task force had judged to be important but for which no data existed. Available data were, of course, used whenever possible.

The Pugh-Roberts consultants used the causal structure developed by the task force and the data assembled to represent the model in DYNAMO simulation language. Initial simulations were made with the model and reviewed by the task force for their plausibility. Several rounds of revisions and further task force reviews then took place until an acceptable simulation was achieved. In addition to task force review, several steps were taken to ascertain and improve the model's validity.

As all simulations with the model were initiated with 1972 data (the last year in which a complete set of the necessary data on RNs is available) the model's behavior between 1972 and 1976 was carefully scrutinized and compared to any actual numbers available for that time period. Adjustments were made to correct discrepancies that appeared. Data also were obtained to initiate the model as of 1962, and the period of 1962 to 1972 was simulated and compared to historical data as a further check on model validity. A final check, a process called sensitivity analysis, revealed which assumptions had the greatest effect on model behavior and, therefore, where the greatest caution was needed in interpreting simulation results. Once the model had been validated and appeared to satisfactorily represent the real-world nursing system, the task force posed "what if?" questions about policies and future trends and reviewed simulation results that analyzed those questions.

Overview of the National Nursing Model

This section presents an overview of the model's structure. The model's relationships fall into four highly interrelated and interdependent pieces or sectors.

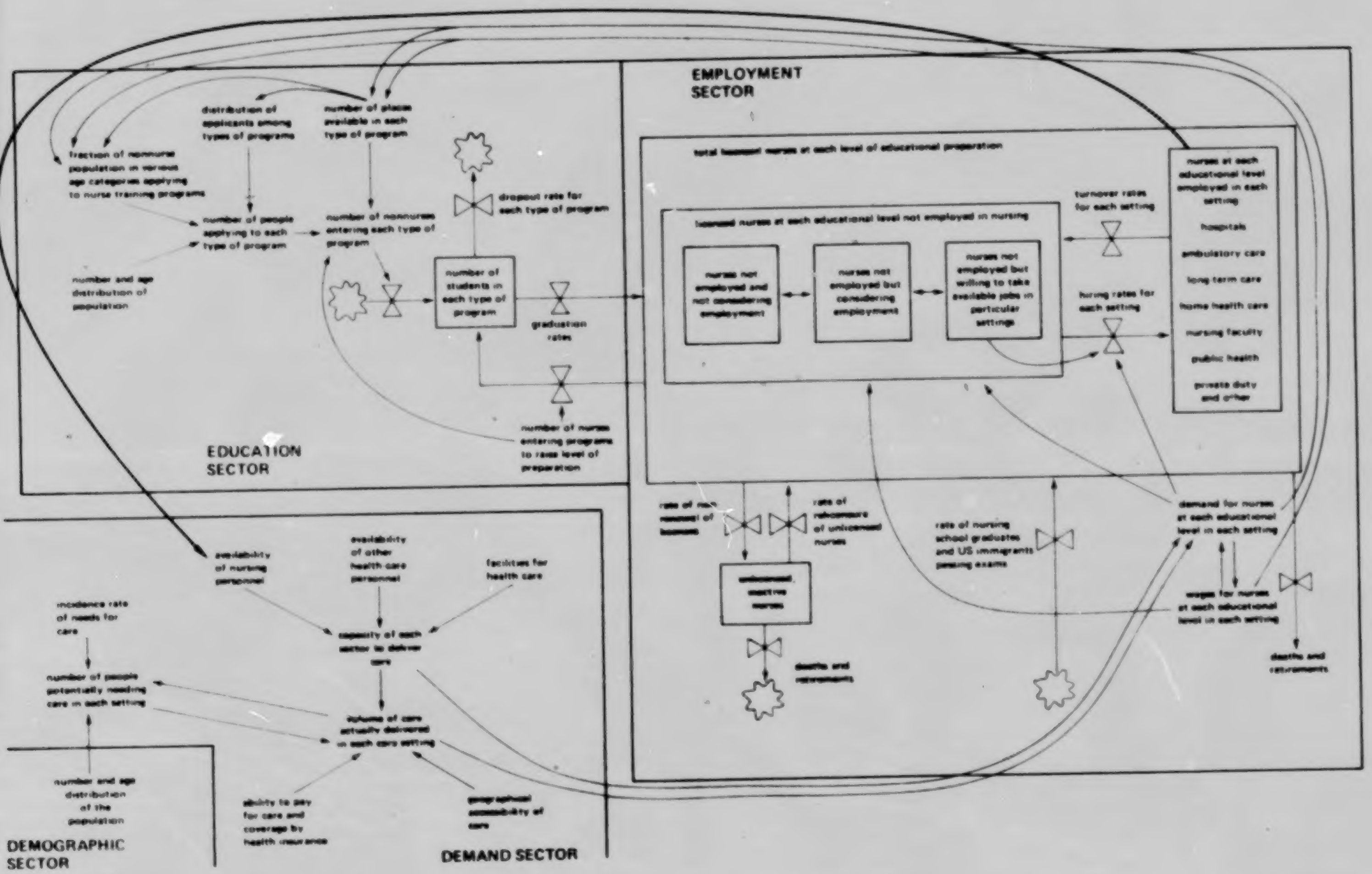
- Nursing education—representing the factors affecting the number of students in each major type of educational program and the graduation rates from these programs
- Nursing employment—representing the factors affecting the number of nurses employed in each setting and various characteristics of employment in each setting, such as nurses' wages and nurses' roles
- Demand—representing the health care provided in each sector of the health-care-delivery system, nursing needs, and nursing jobs available in each employment setting
- Demographic—representing key demographic characteristics of the total population that impact on other sectors of the model, principally the demand sector.

An overview of some of the key relationships in the model is shown in Fig. II.4. As shown in that diagram, the number of nursing students graduating from educational programs, along with other factors, affects the total supply of licensed nurses at each level of educational preparation. Numbers of graduates depend on the numbers of places in programs at each level and the numbers of applicants to those programs. Nursing employment in each setting depends on both the number of nursing jobs available and the number of nurses willing to take those jobs (that is, on both the demand for and supply of nursing personnel).

The health care provided in each sector of the health care system, nurses' wages, nurses' responsibilities, and other factors affect employers' desired staffing patterns and the number of nursing jobs available in each setting. Important influences on nurses' willingness to take available jobs include nurses' wages, nurses' roles and responsibilities, the match between qualifications of available nursing personnel and requirements of available jobs, the location of jobs relative to where available nurses live, and factors affecting the relative attractiveness of employment in different settings. Other important job influences are demographic characteristics such as nurses' age distribution, the fraction married, and childbearing patterns. The volume of health care delivered in each setting is affected by the size and age composition of the total population, care requirements for people in each age group, the financial and geographic accessibility of care, and the attitudes of people toward seeking care. The model explicitly considers seven major employment settings, some of which have several subsettings:

- Hospitals: disaggregated into two subsettings—short-term hospitals and long-term hospitals (chronic disease, mental, TB). Hospital employment includes all nursing personnel concerned with inpatient care and administrative functions, but excludes personnel who provide outpatient care (OPD and emergency room) and are considered part of the ambulatory setting or who teach in hospital-based schools of nursing
- Ambulatory care: disaggregated into three subsettings—physicians' offices and group practices, hospital outpatient departments and emergency rooms, and community health centers and mental health centers
- Long-term care: primarily nursing homes
- Home health care: includes visiting nurse associations and nurses in public health agencies devoted to home care
- Schools of nursing: faculty in programs preparing LPNs and RNs.
- Public health: disaggregated into three subsettings—public health and voluntary agencies (excluding nurses providing home care), school health, and occupational health

Figure II. 4
Overview of National Model of Nursing Supply, Requirements and Distribution


EMPLOYMENT SECTOR
total licensed nurses at each level of educational preparation
licensed nurses at each educational level not employed in nursing
nurses not employed and not considering employment
nurses not employed but considering employment
nurses not employed but willing to take available jobs in particular settings
turnover rates for each setting
hiring rates for each setting
nurses at each educational level employed in each setting
hospitals
ambulatory care
long term care
home health care
nursing faculty
public health
private duty and other
rate of non renewal of licenses
rate of relicensure of unlicensed nurses
unlicensed inactive nurses
deaths and retirements
rate of nursing school graduates and US immigrants passing exams
demand for nurses at each educational level in each setting
wages for nurses at each educational level in each setting
deaths and retirements
distribution of applicants among types of programs
number of places available in each type of program
fraction of nonnurse population in various age categories applying to nurse training programs
number of people applying to each type of program
number of nonnurses entering each type of program
dropout rate for each type of program
number and age distribution of population
number of students in each type of program
graduation rates
number of nurses entering programs to raise level of preparation
EDUCATION SECTOR
availability of nursing personnel
availability of other health care personnel
facilities for health care
capacity of each sector to deliver care
incidence rate of needs for care
number of people potentially needing care in each setting
volume of care actually delivered in each care setting
number and age distribution of the population
ability to pay for care and coverage by health insurance
geographical accessibility of care
DEMOGRAPHIC SECTOR
DEMAND SECTOR

- Private duty and other: includes nurses working for hospitals on a temporary basis through central registries in addition to the more traditional private-duty employment.

Employment reported for any one of these seven settings is the total employment in each of the subsettings.

The model also differentiates among nurses at various levels of preparation employed in each setting and disaggregates educational programs preparing personnel at those levels. Five separate levels of educational preparation are included in the model: one for licensed practical nurses, and four related to registered nurses—associate degree, diploma, baccalaureate degree and advanced preparation.

The model also differentiates among the need for nursing personnel (the number that it would be desirable to employ to serve the population's health care needs), the demand for nursing personnel (positions made available by employers, given the population's actual utilization of and perceived need for health care and various constraints on those employers), and the number of nursing personnel actually employed (given positions available and nursing personnel available and willing to take those positions).

The model shown in Figure II.4 goes beyond previous modeling efforts in nursing by including factors affecting the supply of and demand for nursing personnel in the same framework. Earlier efforts have projected supply or requirements separately. In this model, the number of nursing personnel employers are willing to hire is a function of the numbers available, the financial situation of those employers (as affected by cost controls, adequacy of Medicare reimbursement, etc.), and patient care requirements for which each employer must provide. Similarly, the number of nursing personnel available at any time is determined not only by the number graduated in the past, but also by the number of nurses willing to work as a function of prevailing wages, the breadth of responsibilities entailed in available jobs, and the number of jobs available relative to the number seeking jobs. This is in addition to the age distribution of nurses, their marital status, and career orientations.

A change either in the number of jobs or the number of personnel available will, in time, cause the other to change. As displayed in the model, a constant or declining number of jobs eventually will discourage people from entering nursing programs and dissuade inactive nurses from seeking employment, while an expanding number of jobs encourages growth in applications to nursing programs and higher activity rates. High vacancy rates will cause employers to eventually eliminate some unfilled jobs or fill them with lesser skilled personnel, whereas an excess of nursing personnel will enable employers to deal with pressures to upgrade their nursing staffs. By representing this interaction between supply and demand, the model keeps either one from getting too far out of line and assures reasonable conformity to what would happen in the real world nursing system.

The model represents nursing and health care as they exist now and where they are likely to be in the next few years. Certain developments such as independent nursing practice are not built into the model's baseline assumptions, the set of things likely to happen in the future, because of uncertainties surrounding those developments. This does not preclude the model from dealing with these issues. Instead, it is applied to developments by using it to do a series of simulations in answer to "what if?" questions about those developments. Independent practice, for example, might be explored with a set of simulations that reflect different assumptions about the growth rate for this mode of practice and that reveal its impact on nursing requirements and on the supply of available health care. Many other developments, such as trends toward the involvement of nurses in comprehensive well care and preventive care and other new roles, can be considered in a similar manner. The next section describes the baseline simulation produced by the model and contrasts a number of other simulations with the baseline simulation results. The final section in this chapter draws conclusions about the National Model's strengths and weaknesses and presents the National Model task force's recommendations about future use of the model.

The Model's Use for Examining Policy Questions

This section presents some examples of how the model can be used. The simulations described should be viewed as just that—examples of how a tool can be used and *not* as statements about what will occur in the future or what should occur. The model's principal value is as a tool for policy makers to help them organize their assumptions, force them to think clearly and rigorously about the systems of forces they deal with, and provide them with a mechanism for posing questions about the effects of policies and other forces that impinge on those systems. Simulations in this section illustrate how the National Model can be used by policy makers to evaluate how many different policies, changes, and trends (both those directly related to nursing and those more generally affecting the health care system) will affect the supply of and requirements for nursing personnel.

What Is a Simulation?

Before going further, it is probably useful to explain exactly what a simulation is and how the model is used to produce one. A simulation is a sequence of calculations performed with the model that describes how a system of related factors will behave over time. The calculations begin with a set of initial conditions that represent the status of the system at the beginning of the simulation. Simulations with the National Model begin in 1972, the last year for which data are available for most of the model's variables. Initial conditions are provided for variables that can be counted or measured at any point in time, such as numbers of nurses, hospital census, and enrollments in nursing programs.

The first set of calculations uses the initial conditions to arrive at the rates of change that will prevail during the first time period in the simulation (a month in the case of this model). Rates of change (such as graduation rates) are computed based on enrollments in programs, hiring rates are based on numbers of nursing personnel and jobs available, and turnover rates are based on personnel employed.

Once the rates of change have been computed, the calculations proceed by updating the various quantities in the model to reflect the effect of those rates. Enrollments are decreased by the appropriate graduation rate and increased by an admission rate. Employment levels are increased by hiring rates and decreased by turnover. Other variables change in a similar manner. The updated values of these variables represent the status of the system at the end of the first time period. The simulation proceeds by calculating the next set of changes, again updating the model's variables, and so on, repeating the process until the end of the time period in which the simulation takes place. Values of any variables in the model may be printed or graphically plotted at selected intervals during the course of the simulation.

Each simulation requires two things. One is the model itself, which contains the set of causal relationships used in all simulations. The model is represented as a set of equations in the DYNAMO simulation language, which are translated by DYNAMO into instructions that can be executed by a computer. The other requirement is a particular set of assumptions that correspond to a given "what if?" question that policy makers want to examine with the model. A question such as, "What would be the implications of increased aid to graduate education in nursing?" would be represented in the model by assumptions that higher levels of financial aid and numbers of places in graduate programs will prevail over the course of the simulation. The results of the simulation done with these assumptions would show the effects of increased aid on the total numbers of advanced program graduates and the numbers practicing in each employment setting.

Many such questions can be examined in a similar manner. The critical thing to look for in the results of any of these simulations is not the absolute values of the model's variables over time, but their values relative to those displayed in the results of other simulations. Such comparisons will enable policy makers to discern the relative impact of various policies, programs, and other forces.

Baseline Simulation

The first simulation presented is the baseline simulation. It is based on a set of assumptions that involve no major changes in the health care system or role of nursing. Historical trends are merely projected into the future for many variables; no change is assumed to take place in others. This is not presented as a scenario of what is likely to occur. Rather, it is a simulation with a fairly neutral set of assumptions against which the other simulations can be compared. It is also a useful simulation for examining carefully to better understand the behavior of the model.

It is not important whether one agrees with all of the assumptions going into the baseline simulation. The model is a very flexible tool, and any of a broad range of assumptions can be substituted for those that have produced the baseline simulation. Simulations presented later demonstrate this flexibility. The important thing to remember is that the baseline simulation, whether one agrees with its assumptions, serves as a useful basis of comparison for the other simulations. These comparisons help us to better understand how various changes affect the behavior of the model and, therefore, what effect those changes might have in the real world system of forces affecting nursing.

The assumptions going into the baseline simulation are the ones used in all simulations except for the few assumptions changed in each simulation to represent a particular "what if?" question. In this and all other simulations, the assumptions will play an important role in determining the results of a simulation as long as an imbalance does not develop between the supply of and demand for nursing personnel at the various levels of preparation. If such an imbalance does occur, the model will have its greatest value to policy makers by calculating the adaptions that are likely to occur in adjusting for that imbalance—wage changes, shifts in staffing patterns, increases or decreases in labor force participation, or changes in admissions to nursing programs. A list of the critical assumptions underlying the baseline simulation is provided in Table II.1.

The results of the baseline simulation that used these assumptions are displayed in Table II.2. Values of key variables are shown for 1972 (the initial conditions), 1980, and 1990. Percentage changes occurring over the course of the entire simulation are indicated in the last column. The picture presented by the results shown in Table II.2 is one of a good balance between supply and demand over the course of the entire simulation. The overall average vacancy rate for RN positions in all settings actually declines slightly from 8.4 percent in 1972 to 7.1 percent in 1990. While demand grows by 81 percent during those years, the number of available RNs increases more rapidly (83 percent), and vacancies are reduced even though many more positions have to be filled in 1990. This occurs despite the fact that the total number of licensed RNs grows by only 77 percent from 1972 to 1990, and there actually are slightly fewer licensed nurses in 1990 for each RN position that requires filling.

The source of the additional supply needed to produce the situation seen in 1990 is the larger fraction of the licensed pool that is employed or actively seeking employment. One reason for the growth in labor force participation is the shift in the age distribution of RNs, especially those with associate degrees, toward a larger proportion in the middle-age groups in which participation increases as nurses tend to return to work after rearing children. Growth in the number of jobs available and the greater breadth of responsibilities associated with those jobs also helped to some extent in improving labor force participation. The result is a labor force participation rate (percentage of licensed RNs employed) of 72.9 percent in 1990, as opposed to 70.5 percent in 1972. Not only did employment grow a bit more rapidly than demand or the total licensed pool, the number not employed but actively seeking employment also grew. The number in that category increased by 113 percent over the course of the simulation. Taking the two categories together, 80.1 percent of the licensed RNs either were employed or actively seeking employment in 1990, compared to 73.3 percent in 1972.

Table II.1
Assumptions Underlying the Baseline Simulation

Model Variable	Change Assumed over Course of Baseline Simulation (%)
Places in:[1]	
LPN programs	– 2
AD programs[1]	25
Diploma programs[1]	– 50
Baccalaureate programs[1]	42
Advanced programs[1]	100
Breadth of responsibilities (autonomy, complexity of tasks) of nurses in:	
Hospitals	20
Ambulatory care	15
Fraction of hospitals with collective bargaining agreements[2]	500
Hospital beds:	
Short-term	24
Long-term	– 58
Staffing level per patient in hospitals (includes RNs, LPNs, and aides)	22
RN fraction of nursing personnel in hospitals	26
RNs required for a given number of ambulatory visits	10
RNs employed in community health and mental health centers[1]	39
Physicians in office-based practice	88
Hospital outpatient and ER visits	100
Nursing home beds	20
Staffing level in nursing homes (includes RNs, LPNs, and aides)	15
RN fraction of nursing personnel in nursing homes	10
Demand for nurses in public health agencies (excluding home health)	67
Demand for nurses in occupational health	60
Demand for nurses in home care (includes public health nurses devoted to home care)	97
Demand for private duty nurses	– 40
U.S. Population	15

[1] Most of the change takes place in the first few years of the simulation followed by a leveling off.

[2] Indicates an assumed increase in fraction of hospitals with collective bargaining agreements from 10 percent to 60 percent over the course of the simulation.

Table II.2
Results of the Baseline Simulation

	1972	1980	1990	1972-1990 (% change)
Total licensed RNs	1,127,940	1,556,910	2,000,700	77
RN demand	868,630	1,155,000	1,570,690	81
RN employment	795,260	1,088,330	1,459,100	83
RNs seeking employment	67,100	154,240	142,880	113
Licensed LPNs	544,000	766,060	939,130	73
Employed LPNs	427,000	466,060	502,450	18
RNs with associate degrees	53,630	261,020	500,490	833
RNs with diplomas	894,960	956,640	920,360	03
RNs with baccalaureates	142,730	280,640	479,230	236
RNs with advanced degrees	36,620	58,620	100,630	175
LPN enrollments	51,638	46,098	38,099	– 26
Associate degree enrollments	51,396	75,028	76,547	49
Diploma enrollments	74,815	52,026	38,307	– 49
Baccalaureate enrollments	79,551	120,158	133,382	68
Advanced degree enrollments	6,605	12,258	17,149	160
LPN admissions	61,668	55,968	46,500	– 25
Associate degree admissions	36,972	48,408	50,088	35
Diploma Admissions	29,796	18,720	15,264	– 49
Baccalaureate (basic) admissions	27,372	33,876	34,956	28
Baccalaureate (RN) admissions	5,112	12,072	14,664	187
Advanced degree admissions	3,216	5,856	7,644	138
RNs in hospitals	487,740	702,800	994,810	104
RNs in ambulatory care	86,710	134,470	186,720	115
RNs in physicians' offices and group practices	54,361	82,794	119,454	120
RNs in OPDs and ERs	30,649	49,524	64,894	112
RNs in health centers	1,700	2,150	2,370	39
RNs in nursing homes	56,310	69,840	80,180	42
RNs in home care	17,400	20,360	30,780	77
RNs in nursing schools	29,900	34,210	35,120	17
RNs in public health	72,570	88,260	102,240	41
RNs in public health agencies (excluding home care)	23,370	30,430	38,970	67
RNs in occupational health	19,270	75,360	31,600	64
RNs in school health	29,930	32,470	31,670	06
RNs in private duty	44,630	38,400	29,260	– 34
Nurse pers/pt (short-term hos.)	1.245	1.395	1.574	27
Nurse pers/pt (long-term hos.)	.454	.511	.577	27
Staff mix (hospitals) aids	.423	.342	.272	– 36
LPNs	.193	.197	.196	02
RNs	.384	.462	.533	39
Short-term hospital census	811,000	941,000	1,051,000	30
Long-term hospital census	414,000	226,000	172,000	– 58

This roughly equal balance between supply and demand for RNs is not true of LPNs in the baseline simulation. As shown in Table II.2, the total number of licensed LPNs grows by 73 percent, while the number employed grows by only 18 percent. This occurs despite the fact that admissions to and enrollments in LPN educational programs begin to decline as a surplus of people prepared at the level becomes evident. Admissions and enrollments fall 25 percent and 26 percent, respectively, below their 1972 levels by 1990. The principal reason a surplus is produced anyway is that the numbers graduating at 1972 rates quickly outstrip the growth in demand for LPNs. Between 1972 and 1976, the fraction employed drops from 78 percent to 67 percent because additional jobs that could be filled by new graduates do not appear. The decline in this fraction continues for the rest of the simulation and eventually falls to 54 percent by 1990.

Changes in the numbers of licensed RNs at the different levels of preparation over the course of the baseline simulation are largely a result of changes in the size of educational programs. The number of nurses with associate degrees undergoes by far the largest increase (833 percent) because of the small base from which it started in 1972 and the very rapid growth that occurred in associate degree programs. The number of nurses with diploma-level preparation increases in the early years of the simulation, but declining places and enrollments in diploma programs eventually cause their number to begin falling. That happens when annual graduation rates fall below the rates at which diploma-prepared RNs (many of them in older age groups) are leaving nursing due to retirement, death, and other reasons. Therefore, only a 3 percent increase over the entire simulation occurs, and the numbers of RNs with diploma preparation drop from 79 percent to 46 percent of the RN population between 1972 and 1990. Numbers of nurses with baccalaureate and advanced preparation increase by substantial percentages as a result of the rapid growth in those programs and the small base from which both start in 1972. Numbers of baccalaureate nurses are increased by nurses with associate degree and diploma preparation who returned for baccalaureate-level training. The number of nurses who already have basic preparation admitted to baccalaureate programs each year increases by 187 percent between 1972 and 1990, while basic baccalaureate (generic) admissions increase by only 28 percent during that period.

Changes in admissions and enrollment for programs at all levels during the baseline simulation are shown in Table II.2. Those changes are largely the result of the assumed trends described earlier. Different trends can be substituted easily if the planner disagrees with the trends used for the baseline simulation or if the planner would like to pose "what if?" questions about particular programs. The trend assumed for licensed practical nurse programs was modified somewhat by the model as a substantial surplus of LPNs developed. Had surpluses or shortages developed for registered nurses at various levels of preparation, the model would have modified the trends in programs preparing people at those levels.

There is a wide variation apparent in the degree to which the employment of RNs changes from 1972 to 1990 among employment settings. Hospitals and ambulatory care show the largest increases and have the greatest overall effect on the employment of nursing personnel. Employment of RNs in the home care setting increases at a rate near the overall average growth rate for employment of nursing personnel. Employment in long-term care (nursing homes) and public health, occupational health, and school nursing grows at a slower rate. Nursing school employment grows at a rate of only 15 percent between 1972 and 1990 because of the leveling off or decline that occurs in most programs during that period. Employment of private duty nurses actually declines, as indicated earlier.

The growth in hospitals' demand for and employment of registered nurses is the result of several causes that are compounded together. Pressures to improve the quality of patient care, keep up with technological advances, care for patients with more intensive needs (greater acuity), meet demands arising in collective bargaining, and fulfill broader nursing responsibilities all contribute to the 27 percent increase in the staffing levels (ratio of nursing staff to patients, including RNs, LPNs, and aides) by 1972. These factors, combined with the increased availability of RNs, also result in a shift in the relative size of the fractions of nursing personnel represented by RNs, LPNs, and aides, with a 39 percent increase in the RN fraction occurring by 1990. Most of this shift in staffing mix results from a sizeable increase in the number of RNs employed in hospitals combined with a decrease in the number of people employed as aides.

Shifts also occur in the fractions of hospital-employed RNs who are at different levels of preparation. Changes in the fractions at the associate degree and diploma levels largely reflect changes in the numbers available. Growth in the fractions with baccalaureate and advanced preparation also reflects greater availability to some extent, but also is indicative of a projected need for better prepared nurses to fill new nursing roles in hospitals, such as nurse clinician and nurse utilization reviewer. The 30 percent increase in short-term hospital censes, due primarily to large numbers of people in older age groups who are more likely to require hospitalization, is the final element contributing to the substantial growth in RNs employed in hospitals. The decline in the long-term hospital census has some effect in retarding this growth but only very limited because of the comparatively small number of RNs employed in long-term hospitals.

Employment of RNs in ambulatory care grows even more rapidly over the course of the simulation, reaching a level in 1990 that is 115 percent above its 1972 level. One contributor to this rapid rate of growth is the number of nurses working as primary care nurse practitioners, which increases from 1,398 in 1972 to 22,400 in 1990. As indicated earlier, the remainder of the nurses working in the ambulatory setting are assumed to work as assistants to providers, including physicians, nurse practitioners, and physician associates. In the physicians' office and group practice subsetting, demand for nurses working with providers is actually tied to the number of providers, principally physicians. Over the course of the baseline simulation, the number of physicians in office-based practice is projected to increase by 87.6 percent.

The availability of this many providers combined with increases in the size of the population, especially in older age groups, generates a significant increase in ambulatory visit rates. These higher visit rates also contribute to the growth in demand for nurses in the physician's office and group practice subsetting. In hospital outpatient departments and emergency rooms, a projected increase of 132 percent in visits between 1972 and 1990, based on recent and anticipated trends, creates most of the increased demand for RNs in that subsetting. A small increase in demand for RNs in community health centers and mental health centers and a shift toward a slightly greater fraction of the nursing personnel in ambulatory setting who are RNs both make small additional contributions to the growth in RN employment.

The moderate rate of increase in the number of RNs employed in nursing homes is the result of a 21 percent increase in the average census in those facilities and a 9 percent increase in the RN fraction of nursing personnel employed in nursing homes. The increase in home care employment of RNs reflects a large anticipated expansion in the utilization of that type of service as concern grows about the cost of institutionally based services. Overall employment growth of 41 percent in public health and related settings reflects 67 percent and 64 percent growth in the public health and occupational health settings, respectively, combined with practically no growth in the employment of school nurses (6 percent).

On the following pages two additional sets of simulations performed with the National Model are described and their results compared with the behavior seen in the baseline simulation. These additional simulations explore the effects of health system changes generally and particular changes specific to nursing.

What If Major Health System Changes Occur?

The baseline simulation assumed no major changes would occur in health care delivery and that current trends would merely continue. One use of the model for policy makers clearly is to examine the impact of major health system changes in nursing supply and requirements. The following set of simulations illustrates how the National Model can be used for this purpose:

- A "pessimistic" future involving severe constraints on health care delivery and on the role of nursing in the health care system
- A future in which no major changes take place in insurance coverage or in the overall volume of services provided, but in which strict utilization controls cause major shifts in the proportion of care delivered in each setting (for example, more home care, less hospital care)
- A national health insurance program that produces an increase in the demand for health care
- A national health insurance program implemented with strict utilization controls that produce shifts in the proportion of care delivered in each setting.

The 1972 initial conditions for those variables used in all simulations are the same as those shown in the baseline. Again, these simulations are not intended to be predictions of what will happen if certain health system changes occur but have their principal value when compared to each other and to the baseline simulation. To facilitate such comparisons, percentage differences between the 1990 values of selected variables in the baseline simulation and the 1990 values of those variables in each of these four simulations are shown in a set of bar charts in Fig. II.5.

Health Care System under Severe Constraints

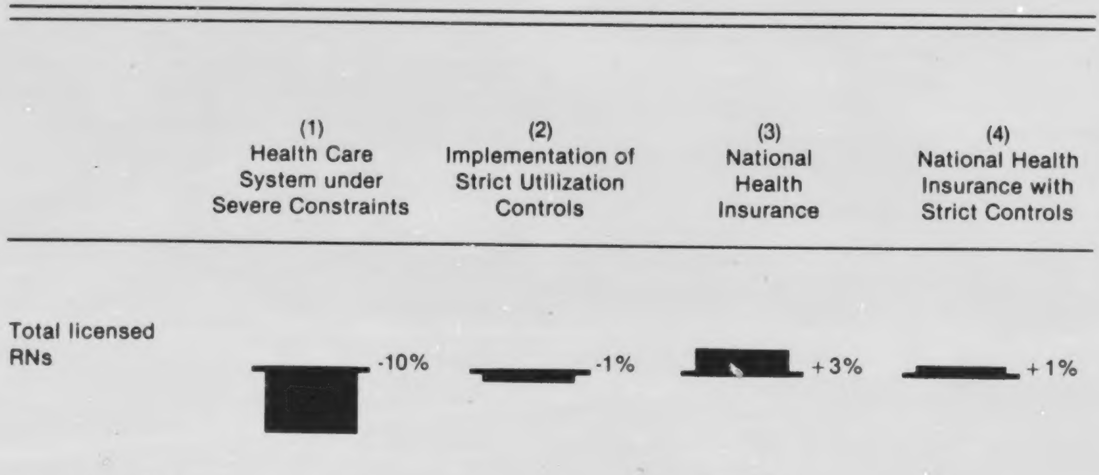
A severe negative impact on nursing demand and employment assumed in the first simulation (severe constraints on health care delivery system) is evident in Figure II.5. The conditions assumed are as follows:

- Increasingly great financial pressures on hospitals during the course of the simulation
- No expansion of the breadth of responsibilities (autonomy, complexity, competencies required) of nursing personnel in hospitals
- Much slower growth (than assumed in the baseline) in the RN fraction of nursing personnel in hospitals
- Slower growth in the number of nursing personnel per patient in nursing homes
- Employment in home care and public health settings grows much more slowly than in the baseline
- Places in diploma programs declined much more rapidly in this simulation because of the financial pressures on hospitals
- Increased employment of nurses by hosiptals on

a temporary basis through central registries (part of private duty employment) because hospitals cannot afford sufficient permanent staff.

The overall impact of these changes in the baseline simulation's assumptions is a significant reduction in the demand for and employment of RNs. Demand (available positions) in 1990 is 28 percent below its 1990 value in the baseline, while employment in that year is 27 percent below its baseline value. Because the total number of licensed RNs increases substantially between

Figure II.5
Results of Four Simulations Examining the Effects of Major Health System Changes on Nursing



Note: Percentage differences shown are with respect to the baseline simulation.

1972 and 1990 even though employment grows far less than it did in the baseline simulation, the number who are not employed but are actively seeking employment is 134 percent higher in 1990 than it was in the baseline. The low level of demand relative to the number of licensed RNs available discourages many nurses from even seeking employment. Conditions in demand and employment are bad enough to have a "feedback" effect on potential applicants to nursing schools and administrators of those schools that results in lower admissions rates and enrollments over the course of the simulation. Consequently, the total number of RNs in 1990 is 10 percent below the baseline simulation.

Differences in program enrollments between this simulation and the baseline simulation are evidence of the adjustment the model makes when imbalances arise between the supply of and demand for nursing personnel. A combination of too many nurses being available for too few jobs, no growth in the breadth of nurses' responsibilities during the simulation, and low wage levels makes nursing less attractive to potential applicants and thus reduces admissions to nursing programs. Wages are kept low by the ease with which employers can fill available positions because of excess supply and by the financial constraints on hospitals, the largest employer of nurses, that keep them from paying higher wages. At the same time, administrators of nursing programs respond to the surplus of nurses apparent from the large number unemployed. Though there may actually be a shortage in terms of unmet nursing needs, the model assumes administrators will cut back on places when a large number of people already prepared for nursing careers cannot find jobs.

Imposition of Strict Utilization Controls

The second simulation also reveals a negative impact on nursing demand and employment as a result of utilization controls. In this simulation, these controls were assumed to accomplish the following:

- Reduce hospital admissions and length of stay by 9 percent and 10 percent, respectively, over the course of the simulation as opposed to 2 percent and 4 percent in the baseline
- Cause the number of nursing home beds to grow at only half the rate they were assumed to grow in the baseline simulation as a result of strict facilities review
- Cause nursing home admissions to be fewer
- Create a demand for RNs in home care and ambulatory settings that is significantly higher than in the baseline simulation, as alternatives are sought for institutionally based care.

Figure II.5 shows the effects of the shifts in care delivery among settings. While the total number of licensed RNs remains essentially the same, employment and demand in 1990 are somewhat below the corresponding levels in the baseline simulation. Demand is 16 percent below the baseline 1990 level, and employment is 8 percent lower. The drop in demand principally is the result of a utilization shift from short-term hospitals, the setting that makes the most extensive use of nursing personnel. A 1990 census level in short-term hospitals 12 percent below the baseline level that year is a major contributor to reduced demand for RNs, even though the increased acuity of hospitalized patients causes a 4 percent increase in staffing levels per patient. A census in nursing homes 17 percent below the corresponding 1990 baseline level also contributes to the reduced demand. Lower demand and employment with nearly the same number of RNs results in a number not employed, but actively seeking employment that is 61 percent higher than the number reached by 1990 in the baseline simulation. Educational program enrollments are slightly lower than the 1990 enrollments in the baseline primarily because of the reduced demand in hospitals and nursing homes and the wage impacts of that reduced demand.

National Health Insurance

The national health insurance program portrayed in the third simulation has an obvious positive effect on nursing demand and employment. This sort of program is assumed to have several effects on the health care system and on the demand for nursing personnel: (1) a moderate effect in increasing the numbers of patients utilizing hospitals and nursing homes, (2) a much greater impact on the ambulatory and home care settings, with significant increases in utilization of care and in the demand for RNs occurring in both of those settings over the course of the simulation, and (3) growth in hospital and nursing home beds at a rate somewhat greater than in the baseline simulation in order to accommodate the additional utilization stimulated by the insurance program.

The results shown in Figure II.5 reveal employment levels that are higher than in the baseline simulation, an obvious result of the increased demand generated by the insurance program. By the end of the simulation, hospital census is 11 percent above its baseline 1990 level, and nursing home census is 17 percent higher than its baseline value. The numbers of people receiving ambulatory care and home care also are considerably greater. The consequence of the higher health care demand level for nursing is a level of nursing employment 5 percent above the baseline level and a demand for nurses (available positions) that exceeds the corresponding value in the baseline simulation by 8 percent. Demand for nurses is so strong as a result of the insurance program that enrollments in educational programs respond by reaching higher levels than achieved in the baseline simulation. Due to higher enrollments, the total number of RNs is 3 percent higher than in the baseline by the end of the simulation. Strong demand also results in a smaller number of RNs not employed, but actively seeking employment, as more jobs are available.

The greatest impact of insurance programs on employment is in settings that are least often covered by health insurance now—ambulatory care and home health care. Hospital and nursing home employment experience much smaller increases relative to the baseline simulation because of the smaller marginal effect health insurance programs have on utilization in those settings, given the existing prevalence of coverage for hospital and nursing home services. Nursing school faculty employment is somewhat higher than it was in the baseline simulation because of the higher enrollments. Public health and related settings and private duty nursing essentially are unaffected by the insurance program in the form assumed for this simulation.

National Health Insurance with Utilization Controls

The imposition of utilization controls along with national health insurance has a set of effects that result in only small differences between this simulation and the baseline. Utilization controls are assumed to have the same effect on hospitals and nursing home admissions and length of stay as in the earlier simulation with controls alone. At the same time, the insurance program is expected to have the same effects on hospital, nursing home, home care, and ambulatory utilization that were assumed in the previous simulation with health insurance alone. Other assumptions underlying this simulation are as follows:

- A significant increase in the demand for RNs in home care will occur over the course of the simulation, reflecting the greater overall utilization of care due to the insurance program and the shifting of some amount of that care into the home care setting as a result of the utilization controls
- Some growth in physicians' office visits beyond that caused by the effects of national health insurance is also assumed to occur as controls shift additional utilization into that setting.

Only small differences are evident in the total number of RNs, demand for RNs, and RN employment. LPN employment is affected slightly as a result of controls shifting some utilization away from institutional settings, such as hospitals and nursing homes, that employ the largest numbers of LPNs. Hospital census is 7 percent below its 1990 value in the baseline simulation, and nursing home census is 17 percent lower. The settings with the largest gains in employment, ambulatory care and home care, are the ones that have derived the greatest benefit from the utilization controls designed to shift care toward the least expensive appropriate setting.

What Are the Effects of Changes More Directly Related to Nursing?

The last set of simulations examined the impacts on nursing of changes in the health care delivery system. The following set of simulations explores the effects of changes that are more directly related to nursing practice, nursing education, and the utilization of nursing personnel in various health care settings.

- One in which the utilization of RNs increases significantly, and the breadth of their responsibilities becomes much greater
- One with expanded involvement of RNs in ambulatory care, home health, and public health and related settings
- A simulation combining expanded graduate education opportunities with greater employment opportunities for RNs prepared at the baccalaureate and advanced levels
- A simulation in which staffing in nursing homes is increased and upgraded (fraction of staff that are RNs increases).

Again, the results of all four simulations are compared with the baseline results to indicate the relative effects of changes represented in each.

Increased Nurse Utilization with Greater Responsibilities

In the first simulation of this set, the following is assumed:

- Nurses working in the hospital and ambulatory settings will experience much greater growth in their responsibilities (autonomy, complexity of tasks) than in the baseline simulation
- Desired staffing levels in hospitals will grow more rapidly than in the baseline
- The fraction of nursing personnel in hospitals and nursing homes that is composed of RNs grows more rapidly as well
- A bias exists in favor of RNs with baccalaureate and advanced preparation in hospitals, schools of nursing, public health, and home care, where nurses prepared at those levels are available.

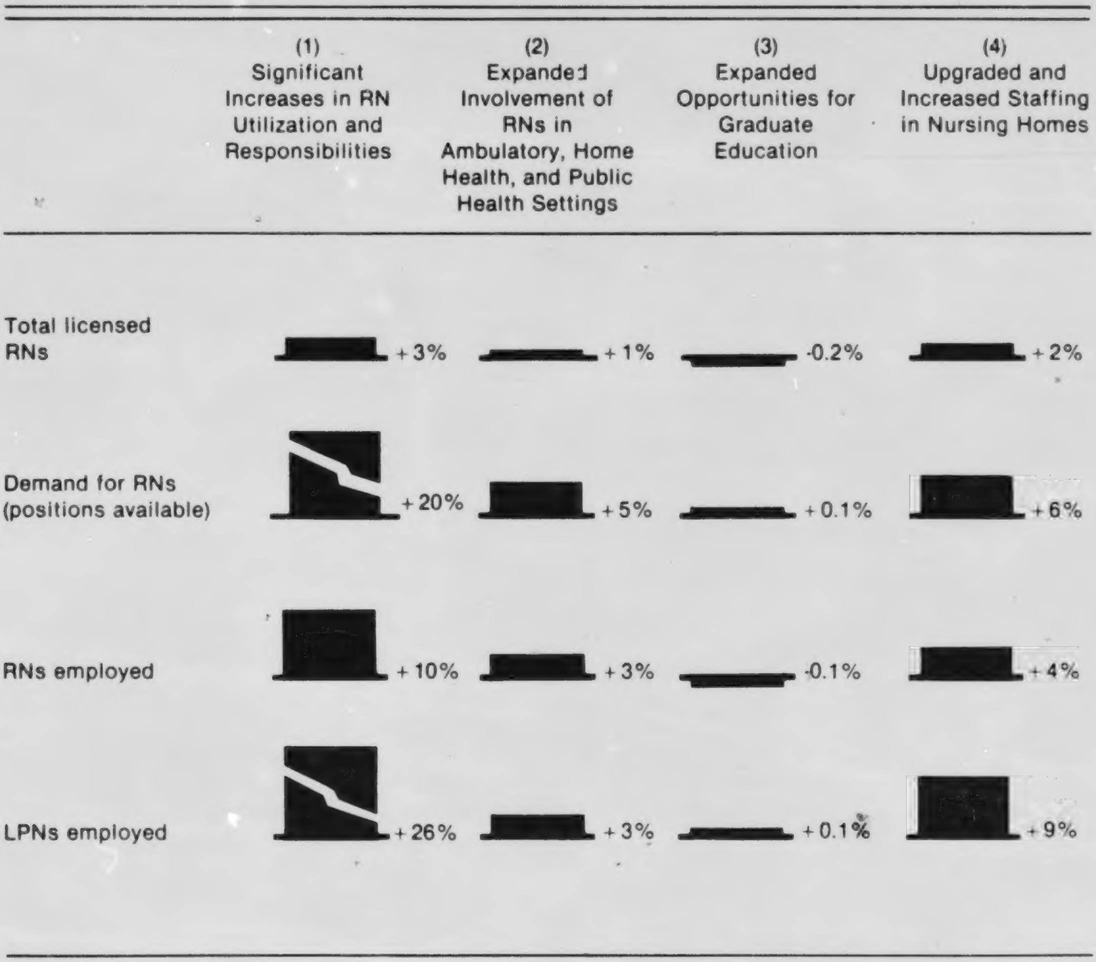
The results in Fig. II.6 show the effects of these changes. The additional demand created by the several trends toward more intensive utilization of nurses and broader responsibilities is so great that employment cannot keep up. Demand reaches a level in 1990 that is 20 percent above its corresponding baseline value, while employment is only 10 percent above its baseline value. As a result, the average vacancy rate across all settings goes from 7.1 percent at the end of the baseline simulation to 14.9 percent in this simulation. This occurs even though enrollment in nursing programs is significantly higher than in the baseline as a result of greater demand

and higher wages. The total number of licensed RNs is 3 percent higher in 1990 than in the baseline. The number of nurses not employed but actively seeking employment is 13 percent below the 1990 value of that variable in the baseline simulation, indicating that more nurses who want jobs are finding them. It is easier to fill available LPN positions created by the emphasis on higher staffing levels because of the large number of LPNs not employed during the simulation. As a result, LPN employment in 1990 is 26 percent higher than its 1990 value in the baseline simulation.

Enrollments in nursing programs range from 5 to 25 percent higher in 1990 than at the end of the baseline simulation. Baccalaureate programs register the highest gain over their baseline enrollments because of the emphasis on more highly prepared nurses and broader nursing responsibilities. The number of nurses with baccalaureate preparation rises to a level 6 percent above its baseline 1990 value by the end of the simulation. A major contributor to baccalaureate enrollments is the admission of RNs with basic preparation who are seeking to upgrade their capabilities. Admissions of this

Figure II.6

Results of Four Simulations with Changes Directly Related to Nursing



Note: Percentage differences shown are with respect to the baseline simulation.

group are 23 percent higher at the end of this simulation than in the baseline. Graduate enrollments show only a small gain over their baseline levels because of the rapid growth in those enrollments already taking place in the baseline.

Expanded Nursing Involvement in Ambulatory Care, Home Health, and Public Health Settings

The second simulation assumes a set of changes that cause growth in nursing demand and employment to take place at a much more rapid rate than in the baseline simulation in the ambulatory, home health, and public health settings. These changes are as follows:

- Significant growth in the breadth of responsibilities of nurses working in ambulatory care beyond baseline levels
- An increase in the ratio of nurses to providers (physicians, nurse practitioners, physician associates) in physicians' offices and group practices
- Growth in the number of nurses working as nurse practitioners in ambulatory settings at twice the rate of increase in the baseline simulation.

The results of this simulation, shown in Figure II.6 indicate this set of changes had a much smaller impact on overall demand for and employment of nursing personnel than did the changes represented in the previous simulation. The increases in demand over its baseline value cause the model to make only minor adaptations by way of higher enrollments. The number of LPNs and their employment level also do not change much from the baseline results. The lack of significant overall changes in the results, even though some major changes were assumed for certain employment settings, indicates how strongly nursing employment is affected by the role nurses play in hospitals. Though employment in ambulatory care, home care, and public health and related settings all are substantially higher than their baseline levels, the overall impact on demand and employment is much smaller than in the previous simulation where nursing demand in hospitals was affected.

Expanded Opportunities for Graduate Education in Nursing

In this simulation there are three assumptions—that there is

- 20 percent more rapid growth in baccalaureate program places than in the baseline simulation
- 75 percent more rapid growth in advanced program places
- A trend to hiring nurses with baccalaureate and advanced preparation in hospitals, schools of nursing, public health, and home care.

The results shown in Figure II.6 reveal that this set of changes has only a limited effect. Graduate program enrollments are 77 percent higher in 1990 than at the end of the baseline simulation, and the number of RNs with advanced preparation is 34 percent higher. No other significant changes are evident. Faculty employment is 11 percent higher than in the baseline to accommodate the larger enrollments in graduate programs. Admission rates to baccalaureate and advanced programs also are higher.

The lack of significant overall impact of these changes is not a comment on the usefulness of expanding graduate education programs but merely a consequence of the small fraction of advanced program graduates in the total licensed RN population. This fraction is a small one, even after greatly expanded graduate programs have been in effect for many years. It is likely the additional graduates would have an impact on the nature of nursing practice and the quality of care that is not readily apparent from the simulation results.

Increased and Upgraded Staffing in Nursing Homes

In the final simulation in this set, an upgrading takes place in nursing home staffing—the ratio of nursing personnel to beds grows at a more rapid rate over the course of this simulation than in the baseline, and the fraction of those personnel that is composed of RNs doubles during this simulation. Results of the simulation shown in Figure II.6 indicate that the changes assumed were sufficient to have some overall impact on nursing demand and employment, as well as having a very large effect on the nursing home setting. Overall demand and employment were 6 percent and 4 percent higher, respectively, than the corresponding baseline values. Demand was sufficient to stimulate larger enrollments in educational programs, which resulted in 2 percent more licensed RNs at the end of this simulation as compared to the baseline. The total number of LPNs and the number employed are up by 4 percent and 9 percent, respectively, over baseline values. The greatest impact, of course, is RN employment in nursing homes, which is 108 percent higher than the 1990 baseline value by the end of the simulation. Demand and employment in nursing homes grow rapidly enough to actually draw some RNs away from hospitals. By 1990 the number of RNs employed by hospitals is down 3 percent, staffing levels per patient are down 2 percent, and the RN fraction of nursing personnel in hospitals is down 2 percent from corresponding baseline values.

The simulations in this section have shown how the National Model can be applied to a number of different "what if?" questions that policy makers might want to consider. Each "what if?" must be presented as a set of changes in baseline assumptions. The relative impact of those changes can then be seen by comparing the results of the simulation to baseline results. Many other questions can be and have been explored in this manner.

Conclusions and Recommendations

The foregoing has described a National Model of nursing supply, requirements, and distribution; the process by which the model was developed; its behavior under different sets of assumptions; and its uses as a tool for answering "what if?" questions about nursing and health care generally. As with any tool, it has uses that are appropriate and uses for which it is not at all suited. As with any tool, it can be put to good use, or it can simply lie on the shelf forever. The following section will first explore uses and misuses of the model and then present recommendations concerning the model's future use.

Appropriate Model Uses

The National Model has several valuable uses that are quite appropriate, given the methodology and data with which the model was developed. The model is:

- A tool for evaluating alternate policies to detemine their effects on nursing supply, demand, and distribution; comparing results of a series of simulations with alternate policies assumed to be in effect will reveal which ones appear to have the most desirable effects
- A tool for assessing and projecting the impacts of various changes in health care delivery on the supply of, demand for, and distribution of nursing personnel
- A framework that assembles the interrelated set of factors affecting nursing that allows participants in a planning process to think through the impact, over time, that changes in one or several factors have on the others
- A guide to gaps that exist in nursing data and to high-priority data needs; the comprehensive view provided by the model highlights additional data needs and indicates where effort can most productively be devoted to data collection—once new data are collected, they can be used to improve the model and to ascertain whether the model adequately portrays the real world.

Inappropriate Model Uses

On the other hand, the model is *not:*

- A predictive tool that can accurately forecast the absolute values of certain variables at points in the future (The nature of the data currently available and the rapid changes taking place in nursing and in health care make such predictions practically impossible; the National Model's principal value lies in its ability to project the relative impacts of various policies and changes in nursing and health care.)
- A means of doing analysis and planning at state, HSA, and county levels at this time (The model has been developed based on national data and can be used only at the national level. Adaptation is necessary for it to be used at state, HSA, and county levels, which would involve representation of certain additional factors, such as those affecting migration of nurses in and out of a state or local area, and which would require a procedure for using state or local data for simulating those areas with the model.)
- A crystal ball that forecasts developments in nursing, such as the emergence of new roles; instead, it represents the basic structure in which possible developments would take place and allows planners to assess the effects on nursing of new developments that might occur
- A policy generator that produces policies as answers; rather, it is a testbed in which alternate policies can be evaluated for their potential impact
- A static representation of nursing and health care that is "cast in concrete"; the model is, instead, a flexible means of representing real world phenomena that can change as people get different insights about those phenomena and as new or better data become available.

Appropriate use of the model within an understanding of how it can and cannot be used is likely to yield worthwhile results for analysis and planning in nursing. Inappropriate use can produce results that are not helpful or might even be misleading.

Recommendations for Further Use of the Model

The National Model Task Force believed the model had a great deal of potential for further use, but felt that two things had to happen for this potential to be realized:

- A mechanism must be established to enable access to the model by interested groups concerned with nursing and nursing manpower issues (The details of such a mechanism would have to be worked out, but it would have to facilitate use of the model for the model to provide ongoing benefits. This mechanism should also allow for a sharing of information by users of the model that would enable them to learn from each other and to contribute to an improved model.)
- As new data become available, there must be a means of integrating them into the model and thereby improving its ability to simulate real

world behavior (New data can be used for two purposes, as indicated earlier. One is to replace numerical relationships in the model that are based on task force estimates with numbers that have a stronger empirical basis. The other is to permit comparison of actual values with model behavior in order to see whether the model adequately simulated observed real world behavior and to allow any modifications that improve the model in this respect. There should be a two-way interaction between model use and data collection, with the model helping to specify the data to be collected in addition to benefitting from data that become available.)

If access to the model and updating based on data available in the future are provided, the National Model can play a role in analysis and planning for nursing and provide meaningful inputs to nursing manpower policy.

FOOTNOTES

1. Robert Gray and Ken Sauer, *Nursing Resources and Requirements: A Guide for State-Level Planning* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978); and Tom Bergan and Gary Hirsch, *A National Model of Supply, Demand, and Distribution, Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
2. Harvey M. Wagner, *Principles of Operations Research* (Englewood Cliffs, N.J.: Prentice-Hall, 1969).
3. The five requirements planning process steps listed here are set forth in *Nursing Resources and Requirements.* The Panel of Expert Consultants modified the wording for its report.
4. Mark Smith, *Users' Manual for the Profile Data Base* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978); and David Makowski and Mark Smith, *Users' Manual for the Profile Report Generation System* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978).
5. David Makowski and Ken Traut, *Users' Manual for the Requirements Calculation Software* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978); and Ken Woellhof and David Makowski, *Users' Manual for the Resources Calculation Software* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1978).
6. Esther Bright, *The Field Development Component of the State Modeling Activities, Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
7. Joseph R. Martin, Comprehensive Health Planning: *Analytic Concepts* (Chicago: Blue Cross Association, 1975), p. 20.
8. World Health Organization, *World Health Organization: The First Ten Years of the World Health Organizations* (Geneva: 1958), p. 459.
9. Rhode Island, New York, and Colorado have completed applications of the State Model. New York used a modified approach. Colorado had some of the materials from the National Panel of Expert Consultants' work as a resource.
10. The content in the National Model was taken from Tom Bergen and Gary Hirsch, *A National Model of Supply, Demand, and Distribution, Summary Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1976).

Chapter III

Data Base: Development and Improved Data Collection Planning

The specific objectives related to data were:

- To develop a data base, using existing data, by which to support projections of nursing requirements and resources
- To plan for improved data collection in the future by which to support the analysis and planning of nurse manpower supply, distribution, and requirements.

Shortly after the project began, the project's advisory committee recommended that a Taxonomy Committee on Nursing Practice be established: (1) To develop a set of mutually exclusive categories for describing nursing services, and (2) To develop definitions and objective criteria for the classifying of nursing services into these categories.

This chapter provides a summary of the activities regarding the collection and organization of the data, the problems in data collection, and recommendations for improvement in data collection. The work of the Taxonomy Committee on Nursing Practice, which is the first major attempt to categorize and define nursing services, is also included.

Data Base

The WICHE staff, with assistance from the subcontractor, Information Management Services, Inc. (IMS), collected and assessed the numerous published and unpublished data sources and obtained the files from all available nursing and health-related data sources. Only those sources that contained information that could be applied to all states were included in the data bank. The staff was cognizant of the fact that some states had more current information than generally available or had additional data. However, for the purposes of the project it was essential that comparable data be available and useable for all states. Under the terms of the contract, no new data could be collected.

The data sources used for the purposes of this contract included:

American Nurses' Association
    Inventory of Registered Nurses
    Inventory of Licensed Practical/Vocational Nurses
National League for Nursing
    Annual Survey of Schools of Nursing—Registered and Practical Nurses
    Nurse Faculty Census
    Special Survey of Schools of Nursing—Men and Minority Students, Experienced Students
    Nurse Career Pattern Study
Division of Nursing/Public Health Service/DHEW
    Employment Opportunity Study for Newly Licensed Nurses
    Preliminary Projections of Enrollments in Schools of Nursing
    Survey of Public Health Nursing
Bureau of Labor Statistics
    Industry Wage Survey, Earnings and Supplementary Benefits in Hospitals
Bureau of the Census
    Fourth Count, 1970 Decennial Census—Population and Housing
    Series II Population Projections to 1980
    Published Data from 1970 County Business Patterns
National Center for Health Statistics
    Master Facility Inventory—Nursing Homes and Other Health Facilities
    Health Interview Survey
    Natality Statistics
    Mortality Statistics
    Monthly Vital Statistics Report
American Medical Association
    Annual Survey of Physicians
    Published Data from 1973 Physician Master File
American Hospital Association
    Nursing Personnel Survey
    Annual Survey of Hospitals
Vector Research, Incorporated
    Populations Projections, 1972-1985
National Center for Educational Statistics
    Published Data from 1970 Digest of Educational Statistics

It should be noted that the data in some instances went back to 1965, while other data were as recent as 1975. The data base contains more than 500 million characters of data and was processed in a multitude of ways to produce state profile information. The process of creating the data base included extracting selected fields from numerous sources, recategorizing and aggregating where necessary, estimating certain data from baseline data (where the desired data were not available), and then combining the various data subsets to create the data base. Because of the differences in the source data and the nature of the synthesis techniques employed in creating the data base, the data base undoubtedly contains some inaccuracies.

The 54 profile reports prepared at the national level and for each state contain information specifically useful to requirements and resources planning. The five major subject areas covered by the reports are: (1) the social and economic characteristics of the population; (2) the health needs/health status of the population; (3) the facilities and services within the health care delivery system; (4) the nursing personnel—RNs, LPNs, and aides; and (5) statistics on nursing education and licensure.

The project was restricted to the assembly of available data, which does have significant gaps in nursing and related data. These gaps also exist in data about other health professions. For example, the planner who is concerned with nursing requirements and resources will find insufficient information about ethnicity; also, few data currently exist about clinical nurse specialists and nurse practitioners. In addition, data are needed on new work settings, such as independent group practice. These deficiencies in available data derive in part from the legal questions that arise when, for instance, one seeks information about racial or ethnic background of individuals. They also exist, in part, because no consensus has been reached in the nursing community or among data collectors regarding definition of terms and classifications. The problems in the present data and recommendations for improving data criteria are discussed later in this chapter.

Those not technically versed in the collection of data often accept, without question and at face value, the numbers that appear in a statistical report or on a computer printout, when in fact there are limitations on the appropriate use of any data report. The user should be aware of both the nature and the sources of information and the assumptions built into calculations. The data base development within this project is no exception. The user should remember that the data base contains files that were not originally compiled to serve planning purposes, and that a number of assumptions had to be made in order to integrate the information contained in these files.

To alert the user to these limitations, the profile reports derived from the project data base are annotated. Footnotes provide definitions of terms utilized in the reports, identify sources of data and the time spans covered by the data, and make reference to appendix material that gives detailed explanations of assumptions used in generating the data. Users of the planning system approach described in the *Guide* are urged to familiarize themselves with the characteristics and limitations of the various data sources as well as the assumptions used in synthesizing the data. It should be noted that some of the data are available only at the state level, and in a few areas, data are not available at any level.

Because of the differences in the data sources, the dates when the data were collected, and the procedures used to estimate missing data or infer information, the reports should be viewed as approximate. More current and accurate data should be used whenever possible.

Data Directory

As a result of the efforts in collecting the data, it became apparent that a directory of data sources would assist others interested in collecting and utilizing data. Thus, *A Directory of Nursing-Related Data Sources of Information*[1] was produced. This report contains information on 63 data sources related to nursing personnel, nursing education, health care delivery systems, and client population. Although the listing is not exhaustive, it does contain references on some of the major data sources that can be used by planners and researchers in studies concerned with manpower planning.

The *Directory* represents an expansion of the approach taken in the Interagency Conference on Nursing Statistics' two publications which included abstracts of studies. The *Directory* was developed by WICHE with the assistance from one of the project subcontractors, Information Management Services, Inc.

For each of the data sources the following information is included.

Source No. An identification number assigned to each data source, used solely for indexing.

##—ttt...

Title. This item contains the name or title of the study, survey, file, etc.

Subject Classification: Each source has been classified according to its subject matter (e.g., information concerning nursing personnel, nursing education, the health care delivery system, or the client population).

General Description: This description explains the origin of data source being referenced (e.g., results of a study or survey, compilation of data by other means), its original purpose, the sponsoring agency or organization, and any other general information needed to describe the source.

Survey History, Frequency, and Latest Edition: This item contains information about the history or past editions of the study or survey, as well as the latest and those planned.

Data collected From Whom and By What Methodology: This item contains information about the universe of the study or those who provided the information (e.g., hospitals, RNs, students, state and local public health agencies). It also explains briefly the method used in collecting the information (e.g., a complete or sample survey, personal interview, compilation of information reported for other purposes).

Availability/Accessibility of Information

✓*Contact For Additional Information About Study:* A person to contact for detailed information concerning the study methodology, etc.

✓*Availability of Computerized Data File:* Information about the existence and availability of data files resulting from the study or survey. This item also includes the geographic level of detail of the file.

✓*Contact For Acquiring Data File:* The name, address, and telephone number of the person and/or department from whom to order the computerized file.

✓*Related Publications:* A list of the titles of publications that contains data or statistics resulting from the study or survey.

✓*Contact For Publication:* The person or department to contact to obtain copies of publications.

Comments: Any other relevant information.

Abstract of the Data Collection Instrument(s): This abstract of the data collection instrument provides a more detailed description of the subject areas in which data were collected and/or the data items themselves.

Improving Data Collection

Although the data base assembled for the project activities is one of the most comprehensive available, it was recognized that there were gaps, and that some of the data were not current. In addition, the problems of confidentiality, access, and the inadequate levels of coordination between the numerous data collectors were identified.

With the assistance of the Long-Range Data Task Force (See Chapter VII), a report titled *A Blueprint and Recommendations for Improved Nursing-Related Data*[2] was developed. Following is a summary of that report.

The Need for Nursing-Related Data

The long-range need for data to support planning for nursing is evolving and cannot now be described with great precision; nevertheless, three major considerations were identified. First, the need for nursing-related data will be increasingly affected by the data needed to support health planning at all levels. Yet the state of the art in health planning is such that, at least for the foreseeable future, the methods used will not be particularly sophisticated. Most planners will rely on comparative analysis to provide reasonable solutions rather than on "correct" answers. For example, instead of trying to find a "correct" ratio of nurses for a particular patient care need, a planner might develop a number for one situation and compare it to similar situations or to the same kind of patient care need in a different setting. When such comparisons are made, the data used must be compatible; that is, nursing data will have to be collected in standard categories using standard definitions.

The second factor also relates to health planning: that is, the increasing need to be able to make different kinds of data "fit together." This is true for planning both within and between professions. As more and more planning concerns represent broad-scope questions, the planner often must make use of several different sets of information concurrently. If the various data sets cannot be integrated into a single data base, the planner's ability to address those questions is severely limited.

Finally, consideration must be given to the increasingly important role being assumed by a wide variety of agencies, organizations, and associations in the planning process. If this variety of users is to be able to continue to take an active and effective planning role, access to nursing data should be as efficient and inexpensive as possible. Because not all users will be able to collect their own data (in fact, it may not even be desirable that they do so), it is important that the agencies serving as data collectors take the steps necessary to provide adequate and effective access to those data for all legitimate users.

Improvement of Nursing-Related Data

The major focus of the effort to improve nursing-related data was an attempt to identify major gaps and omissions in existing data and to develop uniform definitions for those data items that are most commonly needed and used. A framework (or blueprint) for organizing data about nursing was developed as the primary tool first to reflect an "ideal" data set, and then to evaluate existing data against that ideal in order to highlight major gaps.

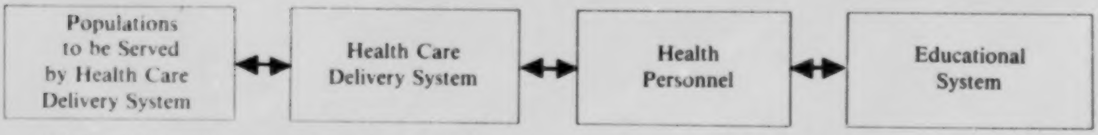
Fig. III.1. shows a scheme for classifying information identified as being important for health planning (with particular emphasis on nursing). It is recognized that there are ways to describe such a framework other than the one presented in this document, as well as different ways of categorizing and defining information. However, the project task force developing this particular framework attempted to look at health system data in a way that would be most appropriate in analyzing and projecting the *need for, supply of, and distribution of nursing personnel.* The framework organizes nursing-related data into four major components (See Figure III.1):

- Populations to be served by the health system
- Health system
- Health personnel
- Educational system.

Definitions of the data items most commonly needed and used also were developed, as generally accepted definitions for most nursing-related data items were lacking. It is hoped that, as the project's definitions are used in the nursing and health care community, they will be revised and improved so that eventually a standardized language of such terms will emerge.

Figure III.1

Framework for Nursing-Related Data


Populations to be Served by Health Care Delivery System
Health Care Delivery System
Health Personnel
Educational System

Characteristics of Population

- Demographic Characteristics
- Values and Beliefs
- Family Characteristics
- Community Characteristics
- Need for Health Care
  - Perceived Health Status
  - Evaluated Health Status
  - Person ⟷ Environment
- Person ⟷ Health Care Delivery System

Health Care Delivery System

- Type of Program(s) Offered
  - Health Care
  - Instructional
  - Organized Research
- Health Care Sponsor/Provider
- Provider Categories
  - Hospitals
  - Residential Facilities
  - Generalized Community Health Organizations
  - Private Office Practice
  - Schools
  - Industry
  - Private Duty
  - Health-Related Organizations and Agencies

Nursing Personnel

- Type of Nursing Personnel
  - Registered Nurses
    - Demographic Data
    - Educational Experience
    - Employment Historical Data
  - Licensed Practical Nurses
  - Nursing Auxiliaries

Educational System

- Kind of Setting
  - Postsecondary Education Institution
  - Other Sponsors/Provider of Educational Program
- Characteristics
- Type of Nursing Programs Offered

Improvement of Current Data Collection Efforts

The approach used to improve current data collection efforts was to involve the major nursing data collectors directly in the work of the project. Most of those data collectors served as members of the Long-Range Data Base Task Force, which meant that the collecting agencies' were a major factor in both the assessment of existing efforts and the development of strategies for dealing with and finding solutions to problems. It is hoped that as a result of this involvement the collecting agencies will work to implement the recommendations that emerged from their efforts.

Improvement of Access to Nursing-Related Data

The development and pilot testing of the state-level model for nurse planning required the identification and use of substantial amounts of nursing-related data. In going through the steps necessary to obtain those data, the project staff gained considerable knowledge of the kind of information available and the sources for it. This is documented in the publication *A Directory of Nursing-Related Data Sources*. In addition, much was learned about problems in accessing the data that are available—problems relating to confidentiality and data ownership, the timeliness of the information, and mechanisms for obtaining data. Some of these are addressed in the project recommendations that follow.

Recommendations for Improving the Data Base

Most of the specific recommendations growing out of the data base activity were directed toward the collectors of nursing-related data, but it was recognized that the problems surrounding the data base do not rest entirely with the data collection system. One concern frequently voiced was that data *users* do not adequately describe the purpose for which they need data. Although it is not always possible to describe the precise purpose, a specification of need will help data collectors to serve data users better, both in improving access to existing data and in defining the kinds of data to collect in future survey efforts.

A second concern related to requests for data is that data access might be improved if collectors could package information specifically for requests that are frequently repeated. Data users might also be more creative in making use of data that are already available.

Finally, it was considered important that data users inform data collectors about their needs, particularly as those needs change over time, and that the two groups establish cooperative relationships. This is perhaps of greatest concern to the data provider—the person or agency who already fills out dozens of forms and may not be able to accept the burden of additional requests.

Recommendations

With these considerations in mind, the following recommendations were made:

Collection of Data about Nurses

1. Data should be collected that differentiate among the various *nursing positions*, that recognize new and evolving roles for nurses, and that use a standard set of position categories and definitions. One of the most important new developments in nursing is an increasing differentiation in nursing services and in the positions of the nurses providing them. It is essential that future planning efforts take these differences into account. A preliminary classification scheme for making these distinctions was begun by the Taxonomy Committee on Nursing Practice as part of the WICHE project and will be continued by the American Nurses' Association. It is recommended that when a final set of categories is available, data about the nurse's job or position should be collected using those categories and definitions.
2. Information about *nursing specialties* should be collected using standard categories and definitions of specialty areas. An increasing differentiation is being made not only in the kinds and levels of functions that nurses perform (which are denoted in nursing positions) but also in the specialty areas in which those services take place. A uniform classification scheme for nursing specialty areas has not yet been developed, but the American Nurses' Association has committed itself to carrying on the work of the WICHE project's Taxonomy Committee (see the next section). Therefore, it should be possible to collect this kind of data in the future.
3. A standardized classification scheme for *health care settings* should be used in collecting information about nurses and nursing services. A set of categories and related definitions for sponsors/providers of health care was developed as part of the WICHE project and is described in the *Blueprint* document. It is recommended that these categories and definitions be used whenever information about the health care setting is collected, whether the setting refers to the "place of employment," the "provider of nursing services," or the "recipient of insurance monies."
4. Data should be collected on the racial/ethnic background of nursing personnel, both as employees and as potential employees of the health care delivery system. This means that racial/ethnic background information should be a part of the data collected when nurses graduate from nursing education programs, when they obtain or renew their license, and when they are employed.
5. Information should be collected that would allow for the investigation and study of the *professional mobility* of nurses as well as their *geographic migration patterns*. Professional mobility refers to movements of the nurses within their profession. Thus, the kind of information needed to look at professional mobility is largely data regarding the nurse's experience and capabilities. Existing data do not provide enough detail about either the kinds of specialty education or experiences nurses have had. Geographic migration can be studied by looking at the nurse's historical record of migration. To predict migration patterns, however, historical

data about movement must be linked with information about the personal and professional characteristics of nurses who exhibit particular migration patterns.

Collection of Data about the Population and the Health Care System

6. Data should be collected that would allow the population to be classified by minority group status in addition to the usual racial and ethnic classifications. A classification scheme should include both racial and ethnic groups and should define the categories so that the population could be accurately divided into exclusive groups.
7. Detailed demographic and socioeconomic population data should be collected and made available at intervals of less than 10 years, now the standard interval period. Current migration patterns cause data at the state level, and particularly at the local level, to be obsolete long before the 10-year census period has elapsed.
8. Efforts should be made to collect more accurate manpower data by industry and occupation. Health planning would benefit greatly if more detailed and accurate data were available. The nursing data collected in conjunction with the 1970 decennial census, for example, were estimated to result in an overcount of nearly 20 percent.
9. Data on the health needs and health status of the population should be collected on state and substate bases. The only data of this type that are currently available are the mortality and birth data collected by the National Center for Health Statistics (NCHS). Information about the number of episodes of major diseases and the number of other physical ailments and impairments—preferably according to population characteristics as well—is also needed.
10. Data on the number and types of services received should be collected on state and substate levels. These should include information about diagnostic, maintenance, and preventive services, as well as information on treatments. (Many types of data related to health needs, health status, and health services currently are collected for use at national or regional levels, but these generally are not suitable for the types of analysis needed at state and local levels.)
11. Additional data are needed on the types, costs, and utilization of services available from different sponsors and providers of health care, and on the client populations and the geographic areas served by specific health care programs.

Access to Existing Data

12. The project report *A Directory of Nursing-Related Data Sources* should be expanded to include additional sources pertinent to planning for nursing and nursing services, and it should be maintained so that it is current at all times. The Interagency Conference on Nursing Statistics has been recommended as the most logical mechanism to carry out these responsibilities because of its national focus and its recognized role within the nursing community.[4] It is hoped that regularly updated editions of *Directory* can be made available to all users of nursing-related data.
13. Each agency that collects nursing-related data should have a clearly stated and well-publicized set of data-release policies and published guidelines on procedures for obtaining data. To the extent permitted by legal considerations, these policies should be designed to promote rather than discourage external use of the data.
14. Both *data currency* (the age of existing data) and *data timeliness* (the time between data collection and data release) should be improved. Because of economic considerations, it is recommended that *priorities* be established to distinguish between data items that need to be collected very frequently and those whose currency is less critical.
15. Current data collectors have not yet developed adequate mechanisms for implementing more liberal access policies. It is recognized that cost is a major related problem, but it is recommended that steps be taken to improve data access as much as current economics allow, and that additional support be solicited to fund improved access mechanisms.

Coordination of Data Collection Efforts

16. It is recommended that the Interagency Conference on Nursing Statistics (ICONS) coordinate the collection and integration of nursing-related data, and that it broaden its focus to examine state and local needs for data as well as those at the national level. It is also recommended that ICONS increase its efforts to ensure that data are collected using standardized definitions and categories and that the data can be "fit together" into a comprehensive nursing-related data base.

Report of the Taxonomy Committee on Nursing Practice

At the outset of the project, it was realized that there was not a set of generally acceptable criteria for differentiating among the various kinds of nursing services that were applicable across the wide diversity of health care settings and across the whole range of present (and, to some extent, future) nursing care services. The project advisory committee established the Taxonomy Committee on Nursing Practice (see Chapter VII) to address this problem. Its mission was to develop a set of mutually exclusive categories for describing nursing services and to develop definitions and objective criteria for the classifying of nursing services into these categories.

The following section summarizes the results of the work of the committee. It must be emphasized that this report is the first step in developing a taxonomy. There is a need for refinement and field testing to develop and implement a nursing taxonomy that will lead to standardization of nursing practice terminology.[1]

The Problem

The committee found that in order to deal with the classification of nursing services, it was necessary first to determine whether nursing services implied the *position* assumed by the nurse or the nurse as a *person*. Committee members agreed that when planners examine the need for nursing care with an eye to satisfying that need, they generally focus on nursing positions rather than on the nurses themselves. From a planner's perspective, nursing services are provided in health care settings (taken in the broadest sense of the term), and therefore are most often associated with the nursing positions that exist within those settings. Although a nurse can be a nurse without holding a nursing position, the assumption was made that nursing services can only be provided through nursing positions within some health care setting (which, of course, would include independent practice). As the objective of the Taxonomy Committee was to aid the planner in evaluating and projecting the need for and the availability of nursing services, the committee decided to focus on the development of criteria for differentiating *nursing positions.*

Nursing Positions: A Definition

Nursing positions are often differentiated within a single employment setting by job titles, but because the committee's efforts encompassed the broad spectrum of health care employment settings, it was necessary to define nursing position independently of job titles. The committee determined that nursing positions should be differentiated on the basis of the level of responsibility inherent in the position and the functions to be carried out as part of that position. It was agreed that the responsibilities and functions associated with the job of a staff nurse, for example, in one organization might differ significantly from those of a staff nurse in another organization. By using responsibilities and functions rather than job titles, actual differences in the nursing services being provided in the two organizations can be highlighted. On this basis, the Taxonomy Committee developed the following definition of position:

> *Nursing position* is that combination of functions to be carried out and responsibilities to be assumed within a particular setting in the nursing system. Nursing positions may require that the individual nurse assume multiple roles in carrying out those functions or assuming those responsibilities.

It is also important to describe briefly the rationale used by the committee in looking at both nursing roles and nursing functions. As discussed above, nursing position is defined to encompass a *prescribed set of nursing care functions,* but the individual nurse may in reality carry out more or fewer functions than are prescribed. The functions that differ from those prescribed, however, relate to the *individual* holding the position rather than to the position itself. Therefore the position is defined to include only that set of prescribed or expected functions and responsibilities.

A somewhat more complicated distinction exists between *nursing position* and *nursing role.* The committee recognized that within a particular nursing position the nurse may assume many different nursing roles (for example, healer, counselor, administrator, teacher). These roles may be inherent in the position, or they may be assumed by the individual nurse outside the context of the nursing position. Nonetheless, a particular nursing position generally will be defined in such a way that it prescribes a *primary role* for the nurse assuming that position. In relating the Taxonomy Committee's categories to actual nursing positions one should focus on the primary role of the nurse holding the position. The committee recognized that for some portion of the nursing population this focus on primary role may create some problems (particularly if those nurses assume several roles on an almost equal basis). It was felt, however, that for the majority of nurses it will be possible to identify a primary role within one of the five major categories identified by the committee.

Categories of Nursing Position

The committee determined that the full range of nursing services could be classified within the following five categories:

- Direct care
- Administrator

- Educator
- Researcher
- Consultant

Each of these categories is discussed and definitions are presented below. These position categories apply *only* to the positions held by registered nurses (RNs). The committee did not address the question of position classifications for either licensed practical nurses (LPNs) or nursing auxiliaries.

Direct Care Position

Definition. This category includes all those nursing positions in which the nurse's primary role is the provision of direct nursing care to patients. The Direct Care nursing position can be further distinguished as either: (1) those positions that require knowledge and skills pertaining to a broad range of population characteristics, for a variety of health care needs, and that can be practiced in multiple health care settings; or (2) those positions that require in-depth knowledge and skills in one particular specialty area.[6] The two basic categories defined within the Direct Care position are "Direct Care Generalist" and "Direct Care Specialist." Each of these two categories can then be further distinguished by level as being either a "Basic" or an "Advanced" level position.

Discussion. The "Direct Care" position category was designed to include all of those nursing positions in which the nurse's primary role involves serving the health care needs of patients. The first basic distinction within this category is between the generalist and the specialist. This distinction is based on the "breadth" of knowledge required to carry out the functions inherent in the position and does not imply that one position is higher or lower than the other.

Thus, it is intended that both the specialist and generalist positions can be filled by nurses at the entry level of nursing skills and competencies. The concept of level is addressed through use of the terms "basic" and "advanced." So, while *all* Direct Care Generalist positions require knowledge and skills for a broad range of health care needs, patient characteristics and health care settings, the advanced generalist position requires a higher level of such knowledge and skills than does the basic generalist position, along with increased responsibilities. A similar distinction can be made between the Basic and Advanced Direct Care Specialist positions.

In defining specific criteria for the Generalist and Specialist categories and for distinguishing between the Basic and Advanced levels within those two categories, the following rationale was used:

1. The distinction between *Generalist* and *Specialist* positions was based solely on the breadth of knowledge requirement for the generalist position vs. the requirement for in-depth knowledge in a particular nursing specialty area for the specialist position.
2. The distinction between the *Basic* and *Advanced* levels was made by focusing on level of responsibility distinctions, as well as differences in the kinds of functions to be carried out. More specifically, Basic-level and Advanced-level distinctions were made by developing "indicators" in four areas:

   Level of Autonomy: The degree of self-direction in the position

   Decision Making: The kinds of decisions that must be made and the degree of risk associated with those decisions

   Intervention Modalities: The level at which interventions take place and the kinds of intervention modalities utilized

   Management: The degree to which various elements of the health care system *other than* the nursing system itself are managed in providing for the health care needs of the patient.

The indicators used for distinguishing Basic and Advanced levels in these four areas apply to *both* the Direct Care Generalist and the Direct Care Specialist categories. Table III.1 lists the specific indicators for the Basic and Advanced level distinctions.

Administrative Position

Definition. This category includes those positions that primarily entail executive, administrative, or managerial responsibility for a nursing agency or system of agencies, or a recognized department or a subdivision thereof. It includes all administrative positions within the nursing system but excludes those positions held by nurses but which are external to the nursing system. It is assumed that these administrative positions customarily and regularly require the incumbent to exercise discretion and independent judgment and to direct the work of others. The following categories may be used if additional detail is desired with the Administrator position category.

- *Executive Nursing Administrator:* A top-level position in which the individual is the nursing executive or administrator of an independent association, agency, unit, or corporation within the nursing system. Positions within this category generally require that the nurse be responsible primarily to the people being served or directly to the governing board.
- *Principal Nursing Administrator:* A position in which the nurse administrator has authority and concomitant responsibility for a single or multiple units within an institution and in which she is accountable directly to a higher administrative level that reports to the governing board.

Table III.1
Indicators of Level—Direct Care Position

Area	Basic Level	Advanced Level
1. Level of Autonomy	Semi-autonomous	Autonomous
	Limited degree of self-direction	Major degree of self-direction inherent in position
	Work generally under direction of more highly qualified health professional	
2. Decision Making	Primarily involves making judgments based on verified, well-established, and specific knowledge	Often requires nurse to be able to test and validate "hunches" and to clarify ambiguities
	Involves decision making for "categories" of problems for which prescribed answers generally exist	Involves making judgments on basis of incomplete and nonverified knowledge
	Decisions are generally low risk in nature	Decisions often involve certain degree of risk
	Decisions require limited differential judgments	Requires nurse take range of differential judgments and then make decision on basis of those judgments
3. Intervention Modality	Involves processes and procedures that are essentially standardized and for which outcomes are predictable	Requires that interventions involve certain degree of creativity and often be individualized in nature
	Involves basic data-gathering skills and standardized intervention strategies	Often requires intervention strategy be based on outcomes that must be predicted rather than those that are known
	Requires initiation of actions that are primarily responsive to patient's needs	Requires initiation of actions based on plan for influencing patient's overall well-being rather than simply reacting to particular problem or need
4. Management	Limited or no requirement that nurse coordinate or manage elements outside nursing care system	Requires ability to identify resources outside nursing care system that can be brought to bear in serving patient's needs
		Requires that nurse deal with multiple health care subsystems or elements to provide individual, family, or community with general health and illness care
		Often requires that nurse modify system to serve patient's needs
		Often involves participation in intersystem mechanisms that influence patient's care

- *Mid-level Nurse Administrator:* A position in which the nurse administrator has authority and responsibility for a single unit that is higher than the lowest level for which management is required or for multiple units at the lowest management level.
- *Nursing Manager/Coordinator:* A position at the lowest level for which the nurse's primarily responsibility can be described as administrative in nature. This category would not include team leaders whose primary responsibility would be "Direct Care" rather than "Administration" but would include the head nurse if that person's primary role is an administrative one.

Educator Position

Definition. This category includes those positions in which the primary role responsibility is the teaching of nursing, either in a formal educational nursing or multidisciplinary program, a continuing education program, or an inservice program in a health care institution (e.g., inservice directors). This classification derives from the institution's standard perception of the employee, but such perceptions are reflected most accurately in the assignments that the institution gives. Thus the dean or associate and assistant deans of a college of nursing, even though they may also carry the title of professor, are not members of the educator classification unless they spend at least 50 percent of their time in instructional activities. The following discussion permits classification of staff within designated rank, visiting scholars, and so forth, on a single scale. (Teaching of patients is considered part of the Direct Client Care category.) The following subcategories can be used in designating different levels.

- *Senior Instructor:* Assignment and classification at this level connotes the expectation of substantial professional and academic teaching experience. Expectations include academic and scholarly performance in such areas as curriculum development, excellence in teaching and evaluation, development of knowledge and other contributions to the academic field, and maintaining excellence in clinical content. Most commonly, assignment and classification at this level may be associated with such titles as professor and associate professor, with preferred qualification through doctoral preparation or substantial experience beyond the master's level.
- *Junior Instructor:* Assignment and classification at this level implies professional and academic responsibility and experience at an entry or intermediate level. This instructor performs teaching activities at a level for which he/she is prepared, is given considerable latitude of independence in the performance of assignments, and shows signs of continued development of teaching effectiveness in other areas as designated above with the senior instructor. Most commonly, assignment and classification at this level may be associated with such titles as assistant professor, instructor, or inservice instructor. Preparation is expected to be at least the master's degree in nursing.
- *Assistant Instructor:* Assignment and classification at this level implies that personnel in this category require guidance from others and are engaged in directed teaching activities. They are not expected to be primarily involved in scholarly academic pursuits as is the case with senior or junior instructors. These positions are staffed by people who may have a master's degree in nursing or who hold a baccalaureate degree and should include such titles as teaching associate, teaching assistant, teaching fellow, inservice instructor, and temporary teaching aides.

Researcher Position

Definition. This category includes those positions in which the primary role responsibility is to direct and/or engage in nursing research studies. The following subcategories can be used in designating different levels.

- *Senior Researcher:* Assignment and classification at this level implies full responsibility, including initiation and direction of research studies and responsibility for communication of findings. Preferred educational preparation is at the doctoral degree level or with considerable experience beyond the master's degree level.
- *Junior Researcher:* Assignment and classification at this level implies shared responsibility and participation with senior or experienced researchers who are in the process of developing and refining research skills and research leadership, and delineating important nursing research problems for investigation. Expected minimal preparation is the master's degree in nursing including courses in research.
- *Assistant Researcher:* Assignment and classification at this level connotes responsibility in assisting others in conducting the research study. Educational preparation may vary widely. Titles typically associated with this level include research assistant, research associate, research fellow, interviewer, data collector, and laboratory recorder.

Consultant Position

Definition. This category includes those positions in which the primary responsibility is an advisory one.

Nursing-related areas in which consultation is requested may include client care, administration, instruction, and research.

For consultation in client care, the expected educational preparation is at least the master's degree. For consultation in administration, instruction, or research, the preferred educational preparation is at the doctoral level.

Specialty Areas

In defining the position category of Direct Care Specialist, it was necessary to address the question of what constitutes a *specialty area* within the nursing care system. It should be emphasized that this is different from the question of what constitutes a *specialist position* in the nursing care system. The Taxonomy Committee deliberately addressed the second question using the definitions and indicators associated with the position category, Direct Care Specialist position. (Even this question is different from the one that asks which *persons* should be considered specialists—a question which the committee did not address except as it related to a person filling a specialist position.)

The question dealing with *specialty areas* can be addressed independently of competencies, breadth of knowledge, and so forth. It merely asks which areas can be described as specialties within the nursing care system. The committee answered the question by saying that it felt that specialty areas can actually be defined along three separate dimensions:

- Health Care Needs
- Population Characteristics
- Settings

Use of these dimensions in describing particular Direct Care Specialist positions will require that the position be classified in accordance with its *primary* specialty area (that is, the specific specialty area in which it is most important that in-depth knowledge and competencies exist for the nurse to perform the job). Although any particular nurse (person) may have in-depth knowledge in several specialty areas, it was felt that it would generally be possible to describe any single *nursing position* along only one of them. The following lists are examples of the specific specialty areas that can be identified along the three dimensions. It should be emphasized that this list is exemplary only and therefore incomplete. The user can add to these examples using the specialty area that is appropriate for any particular nursing position.

Health Care Needs	**Population Characteristics**	**Settings**
Alcoholic	Adolescent	Community
Burn	Adult	Hospital
Cardiovascular	Aged	Industry
Diabetic	Child	Nursing Home
Gerontologic	Community	School
Hypertensive	Family	
Obstetric/Gynecologic	Infant	
Oncologic		
Rehabilitative		
Respiratory		
Thanatologic		

FOOTNOTES

1. See Mark K. Smith with Jerome Felix, *A Directory of Nursing-Related Data Sources* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
2. Full documentation is given in Douglas J. Collier with Mary Segall, *A Blueprint and Recommendations for Improved Nursing-Related Data* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
3. Agencies included: the American Medical Association, the American Hospital Association, the National League for Nursing, the American Nurses' Association, the Department of Health, Education, and Welfare.
4. The *Directory* is being updated by the Interagency Conference on Nursing Statistics and will be published by the National Health Planning Information Center in 1979.
5. The American Nurses' Association has indicated that it will proceed with the development of the taxonomy.
6. A discussion of the Taxonomy Committee's recommendations related to nursing "specialty areas" is at the end of this section.

Chapter IV

New Approaches for Improving Distribution and Delivery of Care

The specific objectives of the Analysis and Planning Project related to new approaches for improving the distribution and delivery of care:

- To compile examples of innovative approaches for improving the distribution and utilization of nursing services
- To demonstrate the effectiveness of a select sample of such approaches by sponsoring demonstration projects in various geographic and clinical settings
- To analyze the cost effectiveness of selected approaches to the delivery of nursing care.

Innovative Approaches

Nurses are providing health and illness care in such diverse settings as schools and industries, high-rise apartment buildings and store fronts, community health/mental health clinics, physicians' offices, and independent nursing practices. Even in the more traditional settings, hospitals and public health agencies, nurses are continually changing their practice to respond to the needs of clients. Nursing practice today includes physical and psychosocial assessment, diagnosis, treatment, counseling, health teaching, and research. Up-to-date knowledge about how and where nurses are practicing and where they are likely to be located in the future is essential to sound planning for the improved use and distribution of nursing personnel and skills. The compilation of innovative approaches contained in the project publication *Inventory of Innovations in Nursing*[1] is the first major national effort to present examples of nursing practice from these many settings.

The *Inventory* documents the existence of a wide-based determined effort by the American nursing profession to improve health care delivery—to make it available where it is most needed, to those least able to cope with the barriers erected in the traditional system against the old, the poor, the isolated, and racial and cultural minorities. In compiling the *Inventory of Innovations in Nursing*, the term innovation was used to apply both to first-time-ever experimentation and to an approach being tried for the first time in a given setting. Both kinds of innovation are well represented in the publication. It is a comprehensive compilation, but not an exhaustive one, of efforts and accomplishments that can be emulated and replicated. Many nurses *are* making a difference; many more *can*.

The *Inventory* contains 152 descriptions of new and emerging roles, methods, practice sites, and payment mechanisms in nursing categorized under eight major headings: community health services, home health care agencies, school health programs, independent nursing practices, physicians' offices, hospitals, nursing care homes, and educational programs. Generally, each entry includes the title, agency, site, background information, purpose, nursing role, cost, evaluation, and a contact for additional information. Coming from 40 states, the examples include both nursing practice and educational programs that prepare nurses for new roles and settings. They were collected as the result of a nationwide search. Letters of request for information about nurses engaged in innovative practice were sent to individuals, professional associations, health institutions and agencies, and educational programs across the country. News releases about the search were sent to professional journals and newsletters. Nursing literature was examined for possible contacts. The regional center staffs of the New England Board of Higher Education, the Southern Regional Education Board, the Midwest Center at the Saint Louis University School of Nursing and Allied Health Professions, and the Western Interstate Commission for Higher Education made suggestions and referrals, as did members of the advisory structure of the Analysis and Planning Project. The *Inventory* contains all the reports submitted in response to the search effort.

The *Inventory* describes significant work throughout the nation in which nurses are delivering more equitable, high-quality health care to a wide variety of clients. Several general observations can be made about the entries. Nurses are using capabilities commonly identified as practitioner skills, including physical/psychosocial assessment, diagnosis, treatment, counseling and health teaching. These nurses are either practicing or being prepared to practice in a variety of settings, ranging from independent nursing practices to hospital outpatient departments. Their client populations include both specialized groups and whole communities. In describing their roles, these nurses generally identify counseling and health teaching as primary concerns. Prevention is frequently mentioned as a practice objective. Physician consultation for medical services is utilized in all of the examples of nursing practice outside a formal structure. These nurses also report using nursing services of community health agencies, social services, and a variety of federal and private health programs. Nurse practitioner reports are in each of the seven delivery settings and in the education setting listed in the publication.

The descriptions of the 20 community clinics listed in the *Inventory* include striking examples of nurses who have found ways to improve access to and quality of health care. These clinics serve clients who are geographically and/or socioeconomically isolated from the mainstream of health care delivery. Although community support is evident in most of the descriptions, financial support is a major concern. A fee-for-service system is stated as sufficient in only one of the clinics. The remainder depend to varying degrees on federal and state funds, private grants, community donations, and volunteer help.

A recurrent problem is third-party reimbursement for nursing and preventive health care when physicians are not a part of the formal structure. Although some positive efforts are being made in some private insurance companies, the need for more aggressive federal initiatives is underscored by several nurses active in clinics, private practices, and home services. It is hoped that projects such as that of Triage, Inc., which is testing a client-need approach to services under a Medicare waiver, will demonstrate successful alternatives to the present illness-oriented reimbursement systems.

Also included in the *Inventory* are reports of nine independent nursing practices. In one, the nurse describes herself as a nurse practitioner providing general nursing services. Five others are described as psychiatric/mental health nursing practices. Another was established to assist patients and families understand the impact of serious illness and injury, and another to provide health teaching and counseling services to a general client population. The ninth practice is directed toward assisting hospital nursing services to implement primary nursing.

Financial reimbursement is also an issue with nurse practitioners. The nurse practitioner in the general practice describes the difficulties she has had with third-party reimbursement. Psychiatric nurse clinicians and rehabilitation nurses have been more successful in fee-for-service practice, with apparent acceptance by private insurance companies. Five of the practitioners report that teaching, workshop, and consultation activities help supplement their incomes.

The *Inventory* examples include innovations in nursing roles—clinical nursing specialists, educators, patient/client advocates, administrators, and researchers. Such nurses are active in all settings, creating environments to allow the practice of professional nursing as they define it. Nurses in physicians' offices are providing health care that complements medical care rather than echoes it. Nurses in hospitals and in the community are in the vanguard of new approaches to caring for the terminally ill. Nurses in nursing care homes, senior citizens' centers, and low-income housing complexes are providing care to the elderly to help them maintain their health and often their independence. And nurses in all settings are working to provide culturally relevant care to ethnic people of color.

By their accounts, nurses are hampered at times by tradition-bound institutions and agencies, restrictive reimbursement mechanisms, the illness orientation of American health care, and the socioeconomic problems inherent in attempts to provide services for traditionally underserved populations. They are sometimes hindered by outdated ideas about the nursing role in health care, held more often by other health professionals than by their clients. In spite of these roadblocks, the examples described in the *Inventory* illustrate that many nurses have found ways to accommodate their particular vision of what a nurse's role in health care should be.

Demonstration Projects

In mid-1975, a Request-for-Proposal for one-year projects to demonstrate the effectiveness of innovative approaches to improved distribution of nursing personnel and services was distributed by the Analysis and Planning Project to more than 650 health and education institutions and agencies, professional associations, and individuals across the country. Thirty-five proposals were submitted for review.

The evaluation criteria allowed for considerable latitude in the goals and objectives of proposed projects. At the same time, the criteria required specifying the methodology and evaluation plan and an assurance of completion within 12 months. Not surprisingly, most of the 35 proposals described projects that had been in various stages of planning before the Analysis and Planning Project's Request-for-Proposal was issued.

A subcommittee of the project's Advisory Committee selected the projects that met all the evaluation criteria. Seven were awarded subcontracts. The *Inventory* includes in-progress reports on the seven active demonstration projects. They constitute a cross section of concerns regarding the distribution of health care.

At St. Luke's Hospital in Boise, Idaho, and at the Iowa Veteran's Home in Marshalltown, Iowa, nurses worked to improve quality and access in health care delivery for the institutionalized and home-bound elderly and for handicapped adults. At the Tri-County District Health Department in Englewood, Colorado, an occupational health nurse practitioner worked with small industries to provide health care services on a contractual fee-for-services basis. The major area of concern for this project was the alcoholic worker. Nurses who work in the isolated, sparsely populated counties of Montana took part in internship-like programs in organized health departments to increase their community health expertise and to develop a peer-consultation network between city-based and rural-based public health nurses. Intermountain Health Care, Inc., based in Salt Lake City, Utah, directed a rotation program for nurses aimed at improving within the hospital setting the quality and quantity of nursing services for rural communities. At Denver General Hospital in Colorado, a staffing methodology was developed using Decision Analysis as the base. The potential result was to be an inexpensive, relatively simple program that could be easily adapted to other health settings. And in the International District of Seattle, a group of Asian American nurses provided health care to an Asian community, using a blend of East-West health care and the resources of Seattle's health and social service system.

Cost Effectiveness

The *Inventory* includes a cost-effectiveness report of four of the demonstration projects: Seattle; Salt Lake City; Boise, Idaho; and Englewood, Colorado.

This report emphasizes comparison of alternative health services designed to achieve the same or similar goals. When appropriate, the cost effectiveness of a service is examined in terms of the client, the provider, and the community. The report also discusses the problems of evaluating services in light of the scarcity of research data on quality of nursing services, the issues presented by differing cultural values, and the struggle between health- and illness-oriented indicators of success.

More cost-effectiveness studies are needed for the nursing profession to deal effectively with dissemination of innovation. With the ever-increasing cost of health care, there must be critical appraisals of all delivery programs, appraisals that includes all dimensions of effectiveness.

Conclusion

The *Inventory of Innovations in Nursing* demonstrates the nursing profession's commitment to improved access to health care. The examples show nursing working with communities that are geographically, socially, and economically isolated from the mainstream of the health care delivery system. Often, nurses must work without the benefit of support or advice from their peers. The communities in which they practice need and accept nurses as primary health care providers; in several instances, in fact, the community itself had initiated a request for help that resulted in nurse-directed health services.

Communities with limited access to health care may represent diverse races, cultures, age groups, and locations, but they tend to share the common bond of poverty. The reports in the *Inventory* describe the difficulties in making a clinic or health program self-sufficient when the population has little or no health insurance. And even when federal support is available, third-party payers and federal programs seldom reimburse for services initiated by a nurse.

Many examples illustrate the important role of outside funding support in establishing a clinic or health program for an underserved population. They also point out the need for consistent, reliable programs of reimbursement for nurse-initiated health care, including preventive services.

Finally, the *Inventory* gives evidence of the availability of alternatives to institutional-based care. Nurses provide health care services that emphasize client and family strengths and independence through health education programs, home care services, and specialized care in settings such as hospices for terminally ill clients.

The *Inventory* prompts many questions: How do successful models of nursing care delivery differ from similar efforts that failed? What system characteristics enhance development and adoption of innovation? What characteristics do nurses involved in innovation share? What are the barriers to change? How are innovations communicated within the system or organization?

These questions are significant because improvements in the health care system depend heavily on the response of health professionals, and particularly nurses, to change. Planned dissemination of innovation will help eliminate costly duplications of first-time-ever efforts while promoting wide use of professionally sound, practical, and cost-effective approaches to nursing care delivery.

The *Inventory of Innovations in Nursing* will serve its purpose if it stimulates others to pursue new, more effective ways of making the American health care system responsive to and supportive of nursing initiative.

FOOTNOTES

1. Sheila Kodadek, ed., *Inventory of Innovations in Nursing* (Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-2), 1976).

Chapter V

Increasing Knowledge of and Participation by Nurses in Health Planning

To promote the increase in knowledge of and participation by nurses in health planning, three major objectives were established:

- To support regional centers to analyze nurse manpower supply and distribution, to train staff for regional centers, and to help establish communication networks for regional and state level planning
- To train nurse leaders in the use of analytical models and data bases as planning tools
- To conduct national conferences to discuss progress and products of the project and issues related to planning.

This chapter describes activities related to each of these project objectives. It should be noted that the regional centers and the national conferences, in addition to contributing to nurses participation in health planning, provided valuable information to staff on all the aspects of the project. Both of these activities also provided opportunities for nurses and others concerned with health delivery to interact in addressing issues related to planning for and distributing health care.

Regional Centers

From the outset, WICHE staff realized that the success of a national contract would depend on the involvement and participation in the project of the existing interstate education compacts. Regional centers covering most of the United States were developed to assist in the dissemination of information on project activities and to solicit input to various project efforts. Subcontracts were developed with the Southern Regional Education Board (SREB), the New England Board of Higher Education (NEBHE), and Saint Louis University for the 13 states of the Midwest. The regional center activities for the WICHE states were carried on as a part of the total project effort. SREB, NEBHE, and WICHE had in-place councils of schools of nursing. Saint Louis University had been the site of the Midwest Consortium of Professional Education for Nurses (MCPEN) project and had in-place contacts and communication networks available for use. For this project, the Midwest Geographic area was modified from the MCPEN project states to include the 13 states involved in a feasibility study for long-range planning for nursing in the Midwest. The table below lists the states included in the regional centers.

Four states (Delaware, New Jersey, New York, and Pennsylvania) and the District of Columbia were not included in a regional center area. These states and the District of Columbia were represented in other project activities through project committees and in the national conferences.

The objective of the regional centers was to initiate, organize, and strengthen existing organizational elements concerned with the dissemination of information and facilitating the use of products of the national project. Regional center activities included:

- Strengthening networks within and among the

Area	Organization	States
New England	New England Board for Higher Education (NEBHE)	Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont
South	Southern Regional Education Board (SREB)	Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, West Virginia
Midwest	Saint Louis University	Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Wisconsin
West	Western Interstate Commission for Higher Education (WICHE)	Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

states in the region or area and plan for nursing personnel and services

- Facilitating the distribution of information by making available and using appropriate mailing lists
- Conducting a training program within the region as a part of the project
- Undertaking, as appropriate, a regional application of the State Model
- Providing information and making presentations to select individuals and groups.

Regional center staffs identified key individuals from the states in their regions to attend the national conferences. They served as resources in identifying existing activities for inclusion in the *Inventory of Innovations in Nursing.*[2] They identified organizations, facilities, or institutions capable of carrying out demonstration projects.

Within each of the regions, at least one state was selected for field development in the State Model. Regional center staffs assisted in the selection of such states. The staff members also participated in the field development work as participants in field development meetings.

A major focus of regional center efforts was to strengthen communication networks within and among the states in the region to analyze and plan for nursing personnel and services. Regional center staff members identified key individuals, organizations, and agencies whose work was significantly related to planning for nursing personnel and services and their distribution. In addition, they gathered information about the current efforts related to health manpower planning and nurse manpower planning, including activities already underway to evaluate the supply and distribution of nurses in the states. Through formal and informal contacts, regional center staff encouraged key persons and state agencies to initiate or accelerate efforts to develop and implement sound plans for analysis and planning for nursing personnel and services.

All regional centers maintained close contact with key nurses in practice and education, and others who could influence planning for nursing. Such individuals were invited to be members of the regional project advisory committee and to participate in the training and other activities. In some instances they were invited to make presentations during the training sessions within their regions.

Facilitating the Distribution of Information

Another very important role played by regional centers in the Analysis and Planning Project was that of facilitating the distribution of information about the project. This was done in two ways: by making available and utilizing appropriate regional mailing lists and by meeting with representatives of key agencies and organizations within the regions.

Regional center mailing lists were compiled, containing names of individuals, organizations, agencies, and others who should be informed about national and regional project development and activities. These people received the Project Update reports. Staff members of the regional centers used personal contacts, press releases, and regional newsletters to further enhance the dissemination of information. The regional centers conducted training sessions as the section following on training illustrates.

Regional Application of the State Model

At the outset of the Analysis and Planning Project, it was intended that there be a regional application of the State Model in each region. In fact, two of the subcontracts included in the scope of work the expectation that, "As appropriate, the Regional Center staff would assist the National Project staff in its responsibility for carrying out the regional application of the State Model."

As the national project progressed in its first 18 months, it became evident that the development of the State Model would take more time; consequently, a regional application within the term of the contract period was not possible.

The regional centers did, however, contribute to this activity by providing information on special problems related to analysis and planning for nurses in their regions, based on their knowledge and experience with the regions and that of their project advisory committees. This information included such items as the relationship of nurses to health planning, the relationship of nursing planning to education, geeographic distribution, special distribution, place of employment, income, and benefits. Regional center staff members identified and defined characteristics of the states in their regions that had an impact on regional planning. These characteristics included such things as the nursing population, patient population, and the health status of the population. They also identified those unique factors affecting future continued planning for their specific regions: funding, education, legislation, and the role of the professional associations.

Providing Liaison with the Natonal Project

Another dimension of the "communication" activities carried out by the regional center staff was that of serving as a communication link between the national project staff and professionals at state and local levels.

Regional center staff members provided national project staff with specific information about innovative programs in their regions. They provided the names of individuals to be considered for membership on the several WICHE task forces and advisory committees; they identified sources of new and current data for the project data base; and they provided the WICHE project staff with their reactions and suggestions on specific project activities in progress.

In addition, regional center staff members attended and participated in a number of state, regional, and national meetings. For example, presentations on regional center activities, including training activities, were made by regional center staff at both the national conferences. Overviews of regional center activities were provided to the project advisory committees on a periodic basis. Presentations were also made at state and regional meetings.

Summary

Through the establishment of regional centers, nurses and others involved in health planning received information on project activities. The benefit to the WICHE project was valuable input on the project's activities from the regional staff and the regional activities undertaken by those staff members.

Training

To assist in meeting the goal of disseminating and encouraging the use of the project's products and to help nursing assume a more significant role in health planning, the project included a major component of training. The specific objectives for the training component were to:

- Train a number of nurse leaders to use analytical models and data bases as planning tools for improving the distribution of nursing expertise
- Train a small corps of trainers to conduct training
- Develop and test training materials
- Produce these materials for use by interested users
- Develop in the regional centers an ongoing capability for carrying out planning activities and ensure continued use of the project's products.

The commitment to training activities arose from a strong belief on the part of the project staff that nurse leaders need to be informed and active participants in the process of making and influencing policies that affect the distribution of nursing expertise. In addition, participants in training should have the opportunity to become familiar with and to respond to the models and data bases developed through the WICHE project.

The training was intended to provide the 263 participants with opportunities to: receive information about local, state, regional, and national analysis and planning efforts, including the rationale for them; develop basic capabilities in using models and data bases for improving distribution; become aware of the available services and products to support the nursing community's ability to analyze and plan for improved distribution; and encourage involvement (whether individual, agency, or state) so that the above (information, impetus, capabilities, services, products) could be used.

Staff of WICHE, of the training subcontractor, Nursing Care and Consultation, Ltd. (Tucson, Arizona), and of the regional centers whose work involved a training task were faced with several recurrent themes and issues for planning and conducting training. Among those that should be noted:

- Accommodating diverse audiences
- Operationalizing an adult learning model (vs. skills training)
- Experiencing and communicating interdependence in learning and planning
- Selecting different methods and staff for different training requirements
- Testing developed materials and meeting agendas
- Sending, in a timely fashion, pre-meeting mailings
- Readying participants for what lay ahead
- Establishing clarity of expectations
- Reinforcing appropriate applications of training
- Making transitions during the meeting
- Maintaining a rich and challenging learning environment
- Using instructors' perceptions of what is or is not effective and helpful
- Cultivating participants' reliance upon one another as resources for planning.

General Characteristics of the Training Component Participants

Of the 263 persons involved from all regions, about 50 percent were administrators. Approximately 3 percent were involved in direct patient care. The remaining were fairly evenly distributed among faculty, researchers, and consultants, and those holding other positions.

Nursing education programs were the most common employment setting (approximately 45 percent), followed by hospitals (20 percent) and community health centers (15 percent). More than 20 percent reported other settings such as governmental and independent consultation.

In terms of highest level of education attained, more than 15 percent had doctoral degrees, approximately 60 percent had master's degrees, just over 10 percent had baccalaureate degrees, and just over 10 percent had associate degrees or diplomas. The most common basic education program was the diploma (65 percent), followed by baccalaureate and associate degrees (30 percent and 5 percent, respectively).

Slightly more than 85 percent of the participants were white, with the remainder distributed among Blacks, Chicanos, Asians, and Native Americans.

Approximately 8 percent of the participants were in the age range of 25 to 34 years, 33 percent were 35 to 44, 40 percent were 45 to 54, and 18 percent were 55 years of age or older.

Conducting Training in the Regions

Training for analysis and planning of nursing personnel and services was a major activity carried out by the regional center staffs. The analysis and Planning Project staff and the training subcontractor, Nursing Care and Consultation, Ltd., developed the materials used for training. The materials were pilot tested in the West where individuals attended three sessions, each lasting three days, for a total of nine training days. These trainees met in small groups throughout the WICHE region. After each session, the materials were reviewed and modified. Representatives from New England and the South attended the training sessions in the West; staff from the Midwest attended sessions in the WICHE and SREB regions. At these training sessions, regional center personnel not only became familiar with the training materials but were also able to observe the teaching methods used.

Training activities in the other three regions consisted of preparing and conducting training sessions for selected nurses and health planners in regional centers in New England, the South, and the Midwest. The content and format of the training sessions varied among the regions, but generally there were two sessions, each lasting two days, for a total of four days. The training materials that had been used in the West were available for use in the other regions. Extensive background materials were provided by WICHE to the regional center staffs to help in the preparation for the training sessions. Some modifications and revisions of the training materials were necessary, due in large part to the differing time frame of the training sessions. WICHE project staff and the staff of the training subcontractor provided assistance to all regions. In some regions, this assistance consisted of planning and making presentations, while in others the assistance consisted only of making presentations.

The regional staffs took different approaches to training. One region focused on a discussion of nursing manpower studies being conducted in its states. Its plan focused on analysis and planning in general, including

Table V.1

Summary of Approaches to the Training Component among the Regions

Region	Number of Participants	Time Allotment	Nature of Training
West (8 cities)	139	3 x 3 days	Targeted, intensive training sessions using original training materials
New England (Sturbridge, Massachusetts)	38	2 x 2 days	Workshops; replication of above with adapted materials; additional activities to meet regional subcontract
South (Atlanta)	35	2 x 2 days	Working conferences; limited replication of West; some original materials; additional activities to meet subcontract
Midwest (St. Louis)	51	2 x 2 days	Seminars; original materials; limited replication; additional activities to meet subcontract and regional priority.
Total:	263		

the WICHE-conducted Analysis and Planning Project and issues of nursing manpower distribution and principles of modeling, as well as how nurses could take a more active role in planning. Another region condensed the training given in the West, yet presented it in a manner similar to that used in the West. A third region developed a plan that examined the meaning of federal support to nursing, and focused on the Analysis and Planning Project. An integral part of this plan was to explore organizational structures and to promote interstate cooperation. Table V.1 summarizes the regional training by number of participants, time allotment, and the nature of the training sessions.

Training Manual

A Manual for Training in Analysis and Planning for Improved Distribution of Nursing Personnel and Services[1] was developed as a part of the training component to institutionalize the outcomes of training and to provide materials for use in continuing education programs or other kinds of educational activities.

The WICHE staff worked with the training subcontractor firm of Nursing Care and Consultation, Inc., and with regional center staff members in developing the preliminary training materials during the 18-month initial contract period. The project staff took responsibility for preparation and presentation of the project/specific content and undertook the synthesis of materials and preparation of a training manual.

The *Training Manual* takes its place and character from this diverse set of activities. For the teacher, trainer, presenter, or group leader, it is a flexible set of tested activities complete with content, participant-learning materials, and procedural details to bring a group of prospective nurse/health manpower planners to the point of informed and active participation in the planning process.

The contents were reviewed by project staff, the training subcommittee of the project advisory committee, and the trainers themselves, who made helpful suggestions that were incorporated in the final version. The distribution was to the participants at the train-the-trainer workshop, the regional coordinators and training consultants, the regional centers for health planning, the National Health Planning Information Center, DHEW regional nurse consultants, and selected depository libraries and interested persons associated with the project. At this point, the *Training Manual* is viewed as a first edition. The narrative indicates some of its own limitations and suggests areas for further investigation and improvement.

Evaluation of the Training Component

The purpose of the evaluation of the training sessions was to determine whether the training was successful in the short run and whether it could serve as a basis for replication. The American Institutes for Research in the Behavioral Sciences (AIR), the subcontractor for selected evaluation procedures, assisted in this process. Each subcontract that had a training task established its own participant and program evaluation procedures. Although it is not possible to sum up all regions and the evaluation information each provided, in terms of assessing the training component as a whole, some generalizations and indicators are useful, particularly in examining the following questions:

1. Did participants gain/learn from their experience in training?
2. Was the program successful in terms of what it was intended to do?
3. Is there a basis, in the training that was planned and conducted, for replication efforts?

Direct observations by staff and information gathered from tests and other forms indicate that learning did occur for participants. Success often is measured by degrees. The following statements indicate the kinds of evidence that support this generalization and its qualifications.

- Participants were asked by the American Institutes of Research in the Behavioral Sciences to indicate how well they could do (presession and postsession) on five activities. Presession scores were obtained retrospectively; that is, the respondents were asked at one sitting how well they thought they could do before the training sessions and after it. The five activities were: use data for planning, plan for improved distribution within one's sphere of influence, explain what a model is, use other people's models in one's own setting, and understand differences among analytical models. There was improvement in pre- to postscores across all activities and in all regions.
- More than 60 percent of the statements submitted at the end of the session showed high content specificity concerning proposed applications of training; that is, participants knew what they planned to do as a result of their experiences, and their articulation of their plans was specific and in an appropriate direction.

One of the objectives for the training component was the development and testing of training materials. In this regard, it was successful. In addition, the provision of limited training during the 18-month period was very successful. Participant assessments of the program indicate:

- That for nearly 80 percent of the participants, the purpose of the training meetings was clear and they knew what was expected of them
- More than 60 percent of the participants plan-

need to inform others about the Analysis and Planning Project, specifically those at their place of employment, and staff of other agencies in the community, members of state organizations, political leaders and representatives, and students.

Is there a basis for replication of the training that was conducted? The content base for replication is the *Training Manual;* it permits the trainers to select content and methods, given knowledge of their audience and objectives for training. Given that potential trainers can identify appropriate target groups, find the *Training Manual* useful, and can supplement it with more current information, replication efforts could be directed to one or more of the following general areas: (1) heighten awareness (appreciation) of certain issues (such as data collection), (2) understand planning and the essence of planning methodologies, and (3) use output of various planning methods. Each of these may justify a separate training effort. In addition, each region now has evaluation data and participant comments that may suggest replication activities that should be initiated.

There were a number of open-ended items on the AIR documentation instrument. The following statements were summarized from these comments.

- The training sessions were effective in alerting nurses to the need for more direct nursing involvement in problems of supply and distribution. Respondents felt they would need to take a more active and aggressive role in planning for the future.
- Participants felt more familiar with modeling, models, data handling, and planning, but still had numerous doubts and questions. There was confusion over the State Model, what it actually looked like, and who was to use it and how. (The State Model was being developed at the time the training sessions were held.)
- Respondents usually perceived themselves as resource persons. Few comments indicated that respondents were willing to take the initiative in planning; they would help someone else do it but did not see leadership as one of their functions.
- The sessions supported and built the confidence of many participants.
- The need for complete and accurate data as a basis for planning was stressed. Many respondents had not previously been aware of the importance of accurate data bases which was now of concern to them.
- Comments were made regarding content of the sessions and style of the presenters, some positive and some negative. However, the one issue raised repeatedly was participant frustration with lack of availability of models, as they were still in developmental stages.
- One far-reaching result of the Analysis and Planning Project's training effort may be the informal networks of contacts made possible through training meetings. Many comments testified to the value of discussing critical issues with one's colleagues and making new contacts. An important contribution of the training participants to the project was that they brought concerns to the staff either directly or through the staff and subcontractors present.

Train-the-Trainer Workshop

As part of WICHE's commitment to ensure that the products of the project would continue to be used, a train-the-trainer workshop was held in August 1976 in Denver. This meeting provided an opportunity for interested persons who had been involved in the project to receive training materials and to plan for their future use. Twenty-six attended, with all regional centers represented. During the meeting, participants were expected to:

- Review the materials with a view toward engaging a client group and implementing a training session or program
- Design the materials for variations in purpose and in the capabilities of different audiences that might wish to use them
- Provide rationales for these design variations
- Evaluate the variations against training content and process criteria
- Provide consultant assistance with respect to using the materials, design training activities based upon them, and plan for implementation of a training program.

The participants not only met these expectations but also were able to specify individual and team plans for implementation of the training materials and to appreciate what was ultimately expected for trainers. Reports of preliminary plans for replicating training were substantive and promising. Some difficulty arose from the absence of a well-defined context within which training could take on meaning and participants felt that they would need to create or plan for the "discovery" of a context back home.

Summary

It is clear that not only did the training staff face certain issues and attempt to deal with recurrent themes, but also that there were constraints and problems. Perhaps the most widespread difficulties were those associated with time available for planning and conducting training, the assistance that the project could provide participants regarding what was expected of them, and the developmental nature of the training and the project of which it was a part. Given high role differentiation and the many staff and subcontractors involved, communications and planning difficulties were to be expected. With only 18 months for the primary mission of the project and with very few days to conduct training in some regions, most of the training objectives were attained.

In general, there was a readiness on the part of many of those who were involved with this project to implement the training products as soon as they became available. There were specific intentions to make use of the insights, knowledge, and skills gained in the training experience in applications that range from individual to collective action, from individual work settings to the profession and the health care delivery system as a whole. It is anticipated that, as more nurses become aware of the importance of participation on planning bodies, or HSAs, and in other legislative and political activities, additional use will be made of the training process and products developed in the Analysis and Planning Project.

The training component of the Analysis and Planning Project has produced excitement, pride, and challenge for participants, the staff at WICHE, its training subcontractor, and colleagues in the regional centers. Collectively, what has been produced is a potentially powerful resource to the nursing community. This resource potential is being actualized but will need leadership and support in the years ahead.

National Conferences

Two national conferences were held, one early in the project period (September 1975) and the other near to the end of the initial contract period (July 1976). More than 250 leaders, knowledgeable and concerned with nursing's role in health planning, attended the conferences. Potential participants were nominated by key groups in their states. At least two people, preferably one nurse and one nonnurse, were invited from each state and the District of Columbia. Those invited were requested to commit themselves to attend both national conferences. All of the project committees and task forces and representatives from all project activities also attended.

The first conference was planned: (1) to review the proposed approaches and plans of the overall project, and (2) to contribute to the development of procedures for determining the supply of and requirements for nursing personnel and services in each state.

The First National Conference did indeed fulfill its purposes. All facets of the project were submitted to the scrutiny of conference attendees, in repeated sessions, to permit all conferees to participate in more than one presentation. The conferees made substantive suggestions and recommendations for improving the products of the project. Project staff subsequently attended carefully to including the conferees' contributions as the products and activities were further developed.

Two major addresses were given at this conference. These speeches, included in the *National Conferences*[4] publication, are:

"Planning for Nursing: An Old Need, a New Reality", by Jessie M. Scott, Assistant Surgeon General and Director of the Division of Nursing, Bureau of Health Manpower, DHEW.

"Measuring Nursing Supply and Requirements: The State of the Arts", by Dr. Eugene Levine, Project Officer and Chief, Manpower Analysis Branch, Division of Nursing, Bureau of Health Manpower, Department of Health, Education, and Welfare..

As a part of the First National Conference, other (non-WICHE) Division of Nursing Manpower/Modeling projects were shared with conference participants. These included:

1. A Micro-Model for Nursing Manpower Needs
   Community Systems Foundation, Ltd.
2. The Nursing Resource-Service Distribution Assessment Model
   Information and Communication Applications, Inc.
3. National Trends in Registered Nurse Supply
   Research Triangle Institute
4. Determining Intra-institutional Productivity of Nursing Service Personnel
   San Joaquin Project
5. The Effect of Health-Care System Changes on the Requirements for Nurse Manpower
   Vector Research, Inc.

Summaries of these projects and a brief description of the National Health Planning Information Center are included in the *National Conferences* publication.

The minority participants submitted a resolution addressing minority issues and recommendations. This resolution and the activities carried out within the project to further address the issues are included in the Project Update section of Chapter VII. In addition, two issue papers presented at the Second National Conference addressed some of these concerns.

The Second National Conference had two major purposes: (1) to share products of the project to date, and (2) to further address major issues related to planning for nursing manpower.

Again, presentations on and discussions by conference participants of each of the project activities were held. Repeated sessions were scheduled to allow for as much dissemination and discussion as possible within the time frame. As the State Model had not been completed at that time, the sessions provided a second opportunity for critique and input from the conference participants. Updates on the other related Division of Nursing studies were given. A workshop on the Taxonomy on Nursing Positions was also held.

The keynote address, "Nursing Legislation: Present and Future," was given by Constance Holleran, Deputy Executive Director, Government Relations, American Nurses' Association.

Seven papers on issues in planning, distribution, data, policies, and minority concerns were presented which were followed by workshops. The issue papers were as follows:

1. "Analytical Aproaches to Planning for Nursing Personnel and Services," by Dr. Gwendoline R. MacDonald
2. "Nursing Initiatives to Improve the Distribution of Health Care Services," by Dr. Nancy Milio
3. "Nurses and Health Systems Agencies: National, State, and Regional Planning," by Juanita F. Godley
4. "Data Issues in Nursing or, Where Is the Payoff?" by Dr. Ellen T. Fahy
5. "Proposed Policies, Projects, and Programs to Improve the Distribution of Nursing Personnel," by Dr. Anna M. Shannon
6. "Minority Issues in Nurse Manpower Planning: Education and Services," by Dr. Mary S. Harper
7. "Minority Issues in Nurse Manpower Planning: Education and Services," by Rosemary Wood .

In summary, the National Conferences provided the opportunity for more than 250 participants to discuss openly project activities and to set directives for the future. The keynote addresses, the issue papers, and workshops provided additional information to all plus the opportunity to make recommendations. The publication *National Conferences* includes the keynote addresses, the issue papers and workshop summaries, and summaries of the project activities and related Division of Nursing activities.

FOOTNOTES

1. For a full discussion of this activity, see Pauline Gingras, *Regional Centers, Final Report* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1977).
2. Sheila Kodadek, ed., *Inventory of Innovations in Nursing* (Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-2), 1976).
3. J. Kevin Mactavish, ed., *A Manual for Training in Analysis and Planning for Improved Distribution of Nursing Personnel and Services* (Boulder, Colo.: Western Interstate Commission for Higher Education, 1976).
4. Pauline Gingras, ed., *National Conferences* (Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-3), 1976).

Chapter VI

The Report of the National Panel of Expert Consultants

The objective for the national Panel of Expert Consultants was to project nursing requirements at a national and state-by-state level five years into the future. Using the State Model approach previously described, a Panel of Expert Consultants (see Chapter VII) projected nursing requirements for 1982. The data from the Panel's work were developed to assist the Division of Nursing in meeting its Report to Congress requirements of the Nurse Training Act of 1975 (Section 951, Part D, P.L. 94-63).

The text of the panel's report is included here in its entirety because its contents are valuable to nurses and to others concerned with health care, its planning and delivery. The assumptions, estimates, and criteria agreed upon by the panel members can serve as a point of departure for other groups using the State Model as a guide for planning.

The panel also made recommendations to meet the nursing requirements for the future. These recommendations will assist individuals educational and service agencies, professional organizations, and/or local, state, and federal agencies in meeting nursing requirements for the future. Since the complete text is included, some content repeats information in earlier chapters of this monograph.

In addition, an addendum has been added to the report. It compares requirements and resources for registered nurses and licensed practical nurses for 1982, and is included in the chapter following the report.

Chapter VI.1
Summary and Conclusions

Significant changes are occurring within the delivery of health care services. There is a movement toward incorporation of the concept of wellness, which includes prevention of illness, promotion of health, and health maintenance. In addition, the role of the health care consumer is expanding from that of recipient only to a broader concept encompassing planner, implementer, and assessor of the changing health care delivery processes. As consumers become better informed, they will collectively encourage and demand additional health care services of a higher quality. These are but two of the types of changes needed to develop and provide a system of health care that will meet the needs of the citizens of the United States.

The present population growth rate is lower than in the past decades. Concurrently, medical and technological advances will continue to increase the life span of many individuals. Voluntary enrollment in prepaid health insurance plans, plus Medicare and Medicaid benefits, will enable more people to seek preventive care and health maintenance, in addition to acute care assistance. In an effort to increase access to health care, a greater number of services will be provided in the community, in addition to hospitals and other institutional settings. More health care delivery will occur in clients' homes, schools, occupational settings, and newly developed ambulatory care settings where health maintenance and preventive health services will be emphasized. Greater emphasis will be placed on providing health care services to people living in areas that are currently underserved. These changes are necessary to expand the geographic availability of health care services and to address cost containment of such services.

The scope of nursing is enlarging substantially. The demand for nursing services to meet the growing complexity of health care increases the need for nursing personnel who are better prepared in a variety of clinical settings.

The responsibility of nursing in the planning and delivery of health care services and educational programs requires a larger number of registered nurses educationally prepared for leadership in research, education, and administration.

Using the State Model planning process described in Chapter VI.4, a Panel of Expert Consultants reviewed the health care scene, trends, and nursing roles in health care delivery. The Panel then developed criteria to project nursing requirements for 1982. Using the criteria with national data, the Panel projected national requirements. The Panel considered its criteria to be applicable to all states. Thus, using state-specific data on such components as population and services, the Panel applied the criteria to project state-by-state requirements.*

With consideration of population growth between 1976 and 1982 of 6 percent, and within the context of the current and prospective health care scene, the Panel projected a need for 1,219,300 to 1,677,000 full-time equivalent (FTE) registered nurses necessary to meet the nation's needs in 1982. This projection is an increase of 48 to 104 percent above 1976 levels. Additionally, by 1982 the Panel projected requirements of 405,700 to 594,500 licensed practical nurses (LPNs) and of 466,600 to 629,000 aides. (The term aides used here includes nurse aides, orderlies, attendants, and home health aides.) A change of -6 to + 38 percent was projected for licensed practical nurses from 1976 levels, but a 51 to 33 percent *decrease* was projected for aides from 1976 figures. The total of all nursing personnel is a -5 to + 33 percent change.

Within health care delivery settings, the most substantial increases were projected in the numbers of registered nurses needed in nursing homes and community health agencies. The Panel also recommended an increase of registered nurses to staff hospitals, health-related organizations, and schools of nursing.

The Panel's recommendations in relation to educational preparation of registered nurses call for an increase above 1976 levels of 308 to 458 percent prepared at the baccalaureate level and 568 to 945 percent prepared at the graduate level. Concomitantly, the Panel projected a *decrease* of 33 to 13 percent in requirements for registered nurses prepared at diploma and associate degree levels. The Panel's projections call for a marked shift in the percentage distribution by educational preparation of registered nurses. In 1976, only 21 percent of the nurses held baccalaureate or higher degrees. The remaining 79 percent held diplomas or associate degrees. By 1982, 64 to 66 percent of the registered nurses should be prepared at the baccalaureate or higher levels and 36 to 34 percent at the diploma and associate degree levels.

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*The total national figures are not an aggregate of state totals. The range of differences for the total number of registered nurses is only 2.3 to 2.8 percent and thus is not statistically significant.

In reviewing its projections and comparing the nursing work force in 1976 to that in 1963 (when the Surgeon General's report on *Toward Quality in Nursing—Needs and Goals*[1] was completed), the shortage of nursing personnel in the aggregate was less acute. The Panel took note that remarkable advances have been made by nursing and nurses since the work by the Surgeon General's Consultant Group on Nursing in 1963, and also as a consequence of federal investment in support of nursing, of advanced training of nurses, and in research and scientific investigations. The Panel recognized that much of the previous effort had been devoted to addressing the numerical shortage of nurses.

The Panel's projections for registered nurse staffing and educational preparation for 1982 are well above the numbers that currently exist. These projections are the Panel's appraisal of what is required to provide the quality of nursing services needed to provide care acceptable and accessible to nearly all the nation, with consideration of cost containment. The Panel's recommendations will serve as guidelines for nursing and other groups concerned with improving the quality of health care delivery.

The Panel made specific recommendations concerning ways to accomplish the following goals: (1) strengthen the educational preparation of nurses in practice, (2) improve the distribution of nursing services and the delivery of health care, (3) improve the practice of nursing, and (4) improve planning to provide adequate educational programs and a sufficient supply of nurses for health services. The recommendations are described in detail in Chapter VI.5.

The Panel recognizes that the responsibility to accomplish all of the recommended goals does not belong to any one single group. The nursing profession, other health professions, community groups, colleges and universities, hospitals and community agencies, the private and public sectors, consumers, and government agencies—local, state, and federal, must join forces if the nursing service requirements for the future are to be met.

Chapter VI.2
Project Overview

Introduction

In the past few years, two major pieces of federal legislation have stimulated an assessment of nursing manpower resources and requirements. The Nurse Training Act of 1975 (Section 951, Title IX, Public Law 94-63) requires the Secretary of the Department of Health, Education, and Welfare to submit annual reports to Congress on the resources and requirements for nursing personnel. This report addresses itself to nursing personnel requirements. (See Appendix A for the Nurse Training Act of 1975, Part D, Section 951.) The National Health Planning and Resources Development Act of 1974 (P.L. 93-641) authorizes state and local planning agencies to develop definitive health plans for services, facilities, and manpower. Additionally, changes that have taken place in nursing education and nursing practice now dictate the need for new methodology for state and local planning, including new approaches to the assessment of nursing requirements.

In March 1975, the Division of Nursing entered into a contract with the Western Interstate Commission for Higher Education (WICHE) to undertake a project titled Analysis and Planning for Improved Distribution of Nursing Personnel and Services. The overall goal was to strengthen the nursing community's ability to analyze and plan for the improved distribution of nursing personnel and services. During the first 18 months, WICHE undertook a variety of activities that included convening two national conferences to disseminate planning methodologies and to obtain input reactions and recommendations from nationally recognized experts, conducting a number of sessions to train nurse leaders in the use of planning tools, compiling an inventory of innovations, and supporting seven projects to demonstrate innovative approaches in the use of nursing skills, establishing four regional centers for nursing planning, supporting several methodological efforts designed to establish data bases, and developing analytical models to project nursing supply and requirements. These activities are described in the Project's publications and reports listed in the Annotated Bibliography.

Of the activities undertaken by WICHE in this Project, one of the most complex was the development of a State Model to be used by state and local planners to project nursing manpower resources and requirements one to five years in the future. As a planning tool, the model allows for variability among the states and requires judgment and decisions by state and local representative advisory groups. The State Model provides an analytical framework and an orderly process for states to use in estimating their requirements. This model achieves maximum usefulness through its sensitivity to many factors such as changes in the delivery of health care services that influence the utilization of nurses and the effect of new nursing roles on requirements of nurses.

The contract was extended so that WICHE could apply the State Modeling process to make state-by-state estimates of nursing requirements through 1982 and thus assist the Division of Nursing in activities relating to the Secretary's 1978 Report to Congress. A major activity during the 12-month extension period was the convening of a Panel of Expert Consultants, which served as a representative advisory group to produce estimates of nursing manpower requirements five years into the future.

The Panel of Expert Consultants

The State Model requires a number of estimates and decisions to be made by knowledgeable experts. Therefore, in consultation with the Division of Nursing, WICHE convened the Panel of Expert Consultants. Selection of Panel members was initiated in November 1976 and was made on the basis of an individual's expertise in one or more areas of nursing service, nursing education, higher education, administration, health planning, operations research, and economics, and in hospital, community health, and health care administration. These Panel members included individuals who served on WICHE's State Model and other task forces during the initial contract, represented professional nursing and other health-related organizations, and provided representation from various ethnic minorities and geographic areas of the country.

The Panel's purpose was to project nursing requirements on both national and state-by-state bases for five years into the future to meet the reporting requirements of Part D, Section 951, of the Nurse Training Act of 1975. The charge to the Panel was to develop assumptions, estimates, and criteria relevant to the components of the model. While recognizing the interrelationship between nurse supply and requirements, the Panel did not project nursing supply, as this task was not part of its charge. Consistent with the State Model process and in the context of changes in both the health care scene and nursing education and practice, the Panel made assumptions and estimates regarding population groupings, health needs, health goals, and health services. It then provided expert judgment on the most cost-effective ratios and types of nursing personnel, on staffing, and on the requirements for nurses with competencies acquired through various types of educational programs. The Panel made recommendations regarding nursing requirements projections as a basis for assisting in identifying needed program directions for nursing and in the development of future legislation.

The precedent for the Panel's effort was the Surgeon General's Consultant Group on Nursing, which developed projections for the number of nurses needed for the 1970s.[2] The Surgeon General's group drew upon its judgment in establishing criteria for determining the numbers and educational preparation of nurses required at the national level. The recommendations of that group served as a basis for the subsequent extensive program of federal assistance for nurse training.

The scope of the Surgeon General's Consultant Group was national only. In response to the 1975 legislative requirements, the Panel of Expert Consultants made a first attempt at establishing state-by-state nursing requirements on the basis of criteria centrally derived by a national panel. These criteria are guides for planning and are neither minimum nor maximum standards.

The Panel began its work in January 1977 and met in five three-day sessions through July 1977. To facilitate its work, appropriate documents on health planning and nursing were provided by the WICHE Project staff and by the Division of Nursing staff. The Panel had access to a most comprehensive computerized data base which had been assembled in the course of the Project.

At the first meeting, the Panel was provided with general background information from the total Analysis and Planning Project and a specific overview of the State Model process. Decision areas that required the advice and counsel of the Panel were highlighted. These centered around the major steps outlined in the State Model process:

- Differentiating the client population
- Assessing the health care needs of each population grouping
- Formulating health care goals and priorities for each population grouping
- Estimating health program and service requirements
- Estimating appropriate staffing patterns

Data displays of the characteristics of the client population on national and state-by-state bases were presented. The Panel made preliminary decisions regarding the classification of population groupings according to selected demographic characteristics that had implications for health care and nursing services.

At its second meeting, the Panel continued its discussion on the ways in which nursing requirements of individual states can be differentially affected by demographic characteristics and the population's health status. Trends in inpatient hospital services were reviewed in relation to their implication for the delivery of health care services. Criteria and standards for nursing staffing were analyzed. The Panel adopted criteria and assumptions and made its initial estimates on staffing and educational preparation for registered nurses in institutional settings. Panel members agreed that the requirements for nurse staffing should be applied equally, regardless of available resources. The requirements as projected will assist a community, a health systems agency (HSA), a state, a region, and the nation in staffing for quality of care.

At its third meeting, the Panel reviewed trends in community health nursing, the role of the nurse practitioner, and the definition of primary health care. It also studied the implications of the primary nursing care assignment method on staffing requirements. The Panel refined its criteria, assumptions, and estimates for requirements for registered nurses and made initial projections for licensed practical nurses and aides.

During the fourth meeting, representatives from the states that pilot tested the model in early 1977 presented data. Criteria and estimates used in the pilot test state projections had been derived independently of the Panel's work. A comparison of the projections made by each of the pilot states with the projections made by the Panel showed similar quantitative results. Regarding educational preparation, the Panel projected that more of the nurses need to have baccalaureate and advanced degree preparation. Also at this meeting, the Panel further refined its criteria, assumptions, and estimates for projecting nursing personnel.

During its fifth meeting, the Panel made final revisions on the criteria, assumptions, and estimates; made recommendations; reviewed a draft of the final report; and suggested changes to be incorporated into the report. Subsequently, Panel members had an opportunity to review the draft that resulted from their final meeting to ensure that the final report reflected its work.

Chapter VI.3
Nursing Today and Tomorrow

A more definitive assessment of the nursing manpower situation, particularly what is likely to happen in the future, is currently awaiting the results of several projects launched by the Division of Nursing in response to Part D, Section 951, Nurse Training Act of 1975, which requested data on nursing resources and requirements.[1] The Congress required information on the supply, current and future requirements, and distribution of nurses within the United States and within each state to determine those areas of the country that are oversupplied or undersupplied or that have an adequate supply of nurses to population. Based on a determination of nursing requirements through 1982, the conclusion from the Panel of Expert Consultants' work is that for the nation as a whole there is no surplus of registered nurses. In every state a shortage exists of nurses with baccalaureate and graduate preparation.

It appears, given a sharp expansion within the health care system and nurses' role in it, that fairly large numerical shortages could occur.[2] Clearly, regional and local shortages continue to exist as a result of the uneven geographic distribution of registered nurses. From a qualitative standpoint, shortages currently exist and are likely to continue long into the future for nurses with advanced preparation in a variety of clinical areas, particularly in community health nursing, as well as in teaching, administration, consultation, and research.

Thus an adequate assessment of the nursing manpower situation must be viewed in the context of the total health care scene in our society, the utilization of nurses in it, and the changes occurring in nursing education and service.

The Context: National Health Scene

Cogent health planning is the current mood in the country. When enacting the National Health Planning and Resources Development Act of 1974 (P.L. 93-641), Congress set forth national health planning goals and standards with respect to the appropriate supply, distribution, and organization of health resources. The preamble of the Act sets forth "equal access to quality care at a reasonable cost" as a national priority.[3] A basic premise held by the Panel of Expert Consultants is that access to health is a right of all individuals.

Ten health policies are enumerated in Section 1502 of the Act, which, under the law, deserve priority consideration in health planning and resource development. These are to be used as guidelines by the National Council on Health Planning and Development and by the Secretary of Health, Education, and Welfare in the formulation of national health goals, as well as by health systems agencies and state health planning and development agencies as they develop and implement their plans and programs. These priorities reflect those policies that Congress believes are especially important for improving the health system. None of the 10 health priorities is new to the health care system or to federal legislation.[4] They are:

1. The provision of primary care services for medically underserved populations, especially those which are located in rural or economically depressed areas
2. The development of multi-institutional systems for coordination or consolidation of institutional health services (including obstetric, pediatric, emergency medical, intensive and coronary care, and radiation therapy services)
3. The development of medical group practices (especially those whose services are appropriately coordinated or integrated with institutional health services), health maintenance organizations, and other organized systems for the provision of health care
4. The training and increased utilization of physician assistants, especially nurse clinicians*
5. The development of multi-institutional arrangements for the sharing of support services necessary to all health service institutions
6. The promotion of activities to achieve needed improvements in the quality of health services, including needs identified by the review activities of Professional Standards Review Organizations under part B of title XI of the Social Security Act, 42 USC 1320c
7. The development by health service institutions of the capacity to provide various levels of care (including intensive care, acute general care, and extended care) on a geographically integrated basis
8. The promotion of activities for the prevention of disease, including studies of nutritional and

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*Although the Act identifies nurse clinicians as physician assistants, the nursing profession does not.

environmental factors affecting health and the provision of preventive health care services

9. The adoption of uniform cost accounting simplified reimbursement, and utilization reporting systems and improved management procedures for health service institutions
10. The development of effective methods of educating the general public concerning proper personal (including preventative) health care and methods for effective use of available health services.[7]

These priorities are, in turn, linked to the overall purposes of P.L. 93-641, which are equal access, improved quality of health care, and cost constraints. Additionally, there is wide feeling that national health planning must encompass more than an extension of the present priorities of the health delivery system and must not be limited to planning solely for medical care. It must be broader in scope, to encompass both health and living conditions that have an impact on people's lives.

To meet changing health care priorities, there has been dramatic change in expenditures on health care in the United States. As a result of Medicare and Medicaid programs, public funds for health have been growing more rapidly than has private spending. In 1950, public expenditures for health care were under $15 billion. During the decade 1965-1975, annual national health expenditures increased more than 300 percent, reaching a total of $118.5 billion. Per capita expenditures rose from $198 to $547, an average annual increase of 10.7 percent. Health care outlays as a proportion of the gross national product rose significantly—from 5.9 percent to 8.3 percent.[8] It is estimated that health care spending approximated $158 billion in fiscal year 1977 and could exceed $230 billion by 1980.[9] The federal government's share of financing has increased by a proportion comparable to the relative decrease of private funds. From 1966 to 1975, the proportion of federal outlays for health more than doubled, to 11.2 percent.[10]

Because much health care is being financed by public expenditures and because there is considerable competition for shares of a finite national economic resource, the need to contain the rising cost of health care becomes an urgent one. Federal policy making in health will be heavily influenced by basic economic considerations until costs can be contained. Programs and priorities, then, must focus not only on keeping costs down but also on increasing the return on the nation's investment by improving access and quality and by utilizing the most cost-effective groups of personnel.

Several approaches are being adopted by state and federal governments to control costs. More than 50 percent of the states have, or are considering, rate review mechanisms to control the costs of hospital care. A second attack on costs is to reduce the number of hospitals through certificate of need legislation. A hospital cost containment bill is being discussed in Senate and House health subcommittees.[11]

Currently, the largest proportion of the health care dollar is expended in hospitals, although only 5 to 10 percent of the population is institutionalized during a given time period.[12] In 1974, one-quarter of the acute care hospital dollars went for nursing services. Ceilings have been placed on nursing budgets in certain hospitals across the country, budgets have been reduced, and limits have been placed on the number of nursing hours that hospitals can provide to their patients. Time studies conducted by management engineering firms have emphasized the average time required by registered nurses to complete physical tasks while neglecting other nursing care functions. Thus, standards have been set for nursing staffing that are often below that seen by nursing administrators as necessary to provide quality nursing care. Yet there is little documented information available on the income to the institution generated by nursing service units.

To achieve optimal cost effectiveness, nursing needs to consider how to deliver the best nursing care in the most appropriate manner and place at the lowest cost without compromising access to and quality of care. In the DHEW *Forward Plan for Health, FY 1978-1982,* it is stated that significant cost-effective programs can be appropriately achieved only by changing the structure and/or functioning of the delivery of health care services.[13] Shifts need to be made in the way funds are spent—by discontinuing or reducing some activities while emphasizing others—to assure that health services are delivered in the most economical and efficient manner.

The Panel of Expert Consultants has emphasized the need for a wellness/preventive care orientation in health planning with a consequent rise in ambulatory outpatient and community-based services to meet the health needs of over 90 percent of the population that does not need institutional care. Efforts at health promotion and prevention of disease and disability in schools and places where people work are the most promising cost containment mechanisms for the future. Such cost-effective mechanisms may be achieved only through increased financial support for care outside institutions. Already, clinics located near clients' homes and staffed by registered nurses are providing quality care at reduced cost to their clients.[14]

Health Status and the Health Care Needs of the American People

Health status represents one important measure of the success or failure of health care services. It is a prime factor in selecting program priorities, as well as in determining the need for health care services. There is evidence from declining mortality and increasing longevity rates that, in the aggregate, the health status of the American people continues to improve. Between 1968 and 1975, the adjusted mortality rate declined from 7.3 deaths per 1,000 population to 6.4 deaths per 1,000 population. Infant mortality rates have shown a similar pattern of decline, decreasing at a rate of about 4 percent per year since the mid-1960s. In 1975, the infant mortality rate was 16.1 deaths per 1,000 live births. However, large differentials exist in infant mortality among various segments of the population. In 1975, the rate for Caucasian infants was 14.4 deaths per 1,000 live births, while for non-Caucasian infants the rate was 22.9. The death rate for non-Caucasians has remained approximately two-thirds higher than the rate for Caucasian infants since the beginning of the century.[15] These data indicate probable gaps in the accessibility or acceptability of health care to certain segments of the population. Further, the data suggest that areas where care is delivered by nurses, such as in the clinics suggested above, can make a difference in the health status over time.

Although the population growth rate is decreasing, the proportion of the population that is 65 years of age and over is increasing. The Panel assumed these trends will continue during the next five years. Generally, the elderly have more chronic illnesses and tend to utilize health services more frequently than younger people. Thus, as more people live beyond the age of 65, there will be a growth in the demand for geriatric services and a concomitant requirement for funds to purchase such services.

Better diagnostic methods detect the presence of more diseases. The number of persons with chronic conditions who are in need of continuing surveillance is increasing. Whereas cancer and arteriosclerotic heart disease are the leading causes of death, the long-term care needs of patients with arthritis, diabetes, chronic pulmonary diseases, and respiratory diseases are also vitally important.[16]

The proportion of women who do not receive any prenatal care and the proportion of low-birthweight infants are highest among potential high-risk groups needing health care. Pregnancy rates among unwed teenage girls are also very high and pose particular health hazards to both mother and infant. Social complications occur with respect to obtaining proper pre- and postnatal care for this group of teenage clients. The needs in such high-risk care must be related to the funds available to purchase such services.

As women and ethnic minorities begin to assume higher level positions in the market place, they may be subject to larger numbers of job-related psychological stresses associated with higher rates of heart diseases and other related diseases. As women assume positions formerly held predominantly by men, they are likely to become as subject to environmental hazards (e.g., exposure to harmful chemicals, industrial dust, and accidental injury) as are men. Health services in occupational settings that are coordinated with community health agency services need to be extended for both men and women in the population.

The number of people in the age groups at high risk for mental illness will increase substantialy by 1985. As a result of "bigness," anomie, and rootlessness resulting from living conditions observed in the United States, more people, particularly youths and the elderly, will tend to suffer varying conditions related to emotional disorders. These anticipated changes will increase the incidence and prevalence of mental illness with its subsequent implications for health care.[17]

The above information in the health status of the American people provides clues to health care needs, direction for program priorities, and utilization of health personnel. Since the inauguration of the Medicare program in 1966, there has been an increase in the utilization of acute inpatient care, ambulatory care, and long-term care facilities. Moreover, the increasing coverage of the population by voluntary insurance plans has made it possible to purchase additional health care benefits. As expenditures for health care have increased so have demands risen for nursing services. The rise in the education and economic levels of the population has likewise brought about greater utilization and demand of health services among all age groups. In a recent report on the nation's use of health resources, it was estimated that 1.5 billion ambulatory care visits were made to physicians' and dentists' offices, hospital outpatient departments, public health service clinics, mental health centers, and health care sites in 1973.[18]

Despite the larger number of recorded visits to health care sites, known shortcomings of the health care system still persist. One in four persons still receives less than adequate care.[19] For such people, health care is not available because of factors such as geographic location and economics. In addition to known health care needs, there is a growing number of needs that are only now being identified and that require attention. These health needs grow out of the increase in the abuse of alcohol, drugs, and other substances; out of the increased prevalence of battered children and/or spouses; and out of the lack of care of persons in correctional institutions. Nurses prepared as clinical specialists and nurse practitioners constitute a promising source of manpower to meet many of these needs in cost-effective ways.

The Panel made several assumptions relating nursing services to the health status and health care needs of the population groupings:

1. The need for nursing services is dependent on the characteristics of demographic groupings of

the population classified by age, income level, ethnic group, population density, and selected health indicators and/or risk factors.

2. Effective demand for nursing service is determined by a number of factors, including the historical experience of the population served, access to those services, income available to create jobs for registered nurses or to purchase direct service (e.g., national health insurance or third-party payers), events affecting the health status of the population, enhanced knowledge on the part of consumers, and even the available supply of registered nurses.
3. The strategies selected for providing nursing services are dependent on historical experiences of demographic groupings, client needs, health goals, available nursing supply, and source of income available for the provision of services.
4. The growth of the facilities in which registered nurses are employed is directly related to the historical experiences of demographic groupings served by the facility, the growth of numbers of persons in that demographic grouping, the income available to pay for services, technological innovations, and the number and diversity of physician providers.
5. The current distribution of nursing services to population groups in each state reflects the health care needs of that state, which are specific to the various characteristics of its population, as best projected from available data.

Major advances in improving the health status of the American people will come more from changes in personal life style and control of environmental problems than from personal health care services.[20] Health care can be improved as a result of prevention services and efforts directed toward better educating people about their own ability and responsibility to protect or maintain their health. Prevention of illness and disease and promotion of health are key elements in improving health care.

Preventive care has not been aggressively pursued in the past and has been a weak point in our current health care system. It now appears that increasing emphasis is being placed on disease prevention, as well as on nutrition, the environment, and the development of more effective methods of health education and its promotion in our national health priorities. Recognition is being given to the major opportunities available for reducing health care costs while improving the public's health through health education and disease prevention.

Activities related to disease prevention, health promotion, and health education, as well as detection, referral, and follow-up of health care needs, should be increased in such facilities as well baby clinics, family planning clinics, prenatal clinics, poison information and control centers, multiphasic screening centers, occupational health programs, and school health programs. Access to health information is essential for learning about preventive measures. The preventive care programs cited provide regular screening for early detection and information to consumers so they are better prepared to care for themselves. For example, attempts are made in school health programs to teach students good health habits: to educate them about hazards of smoking, alcohol, and drugs; to help them understand the functioning of their bodies and relate these functions to potential health hazards; and to provide them with content on human sexuality. Schools often have basic programs to check the hearing, vision, and dental conditions of students for early detection of problems.

The nature of major health problems faced by the nation is evidence of the enormous potential for health education and disease prevention. For example, heart disease is clearly related to such personal behaviors as smoking, dietary, and exercise habits. Some forms of cancer are thought to be related to life styles and environmental factors. Similarly, alcoholism and drug abuse are traceable to personal habits.

It was the Panel's contention that nursing encompasses assessing the general health status, health assets, the health potentials of people, and teaching health promotion. The Panel further assumed there will be increasing awareness and utilization of those nursing skills that maintain health and prevent illness. As nurses are prepared to care for people in all settings (e.g., hospitals, schools, homes, occupational settings), nursing will play an increasingly major role in these aspects of health care.

The Delivery of Health Care Services

The delivery of health care services has been fragmented and lacks an integrated system to meet health needs.[21] Care has been predominantly sickness oriented, and, traditionally, physicians have been the patient's point of entry for that care. However, many changes are occurring in the organization and delivery of health care services. These changes, together with the changes in health care technology, the growth in scientific knowledge, the significant impact of the federal government on health, and the influence and recognition of consumer demands will have profound effects on nursing supply and requirements.

One effort at reforming the delivery of health care services has been the establishment of health maintenance organizations (HMOs). Health maintenance organizations have stimulated reforms in health care financing that are consistent with the broad support for realistic quality programs that deemphasize inpatient care and place it in proper context with respect to outpatient care. Thus these agencies provide an alternate means for the delivery of health care. These organizations provide prepaid comprehensive health services for a voluntarily enrolled group of people, including periodic screening, preventive health services, and comprehensive care in the event of illness. In contrast to the traditional hospital system, health maintenance organizations have positive monetary incentives to avoid unnecessary hospital utilization, thus reducing costs. Studies have indicated that HMO clients have a markedly lower rate of hospital admissions and a shorter length of hospitalization than those covered by conventional health insurance plans. There is evidence that subscribers receive an above-average level of care at below-average cost.[22] These health care delivery plans will assume increasing importance in the delivery of health care services. In such organizations, nurses will play a major role in the preventive and health promotion aspects of care.

In the provision of care, there is an increased emphasis on primary health care, especially for residents of rural and medically underserved areas. Primary health care refers to a broad range of personal health care services. These services* include assessment of needs, promotion of the maintenance of health, prevention of illness and disability, basic care during acute and chronic phases of illness, guidance and counseling of individuals and families, and referral to other health care providers and community resources when appropriate; the existence of these services may serve as the point of entry into health care initiated by either the client or the provider.[23] Primary health care also includes the continued care of clients in ambulatory outpatient settings.

Congress has authorized many programs for the purpose of redistributing health service facilities and manpower to provide primary care services to underserved areas. Among these are the establishment of community health centers, migrant and Indian health programs, community mental health centers, alcohol treatment centers, family planning projects, and the National Health Service Corps. Such primary health care, provided usually on an ambulatory outpatient basis, has not only altered the entry points for clients in health care but has also served to heighten interest in the role of nurses with special skills to provide primary health care. The lack of sufficient numbers of primary health care providers has contributed to the extensive utilization of emergency rooms in hospitals.

As a means of reducing unnecessary institutional care and decreasing health care costs, the country is in the process of changing its approach to health care from that of a predominantly inpatient orientation to one with increasing emphasis on ambulatory care and community health facilities for primary care and disease prevention. Health promotion and disease prevention can be provided more readily in an environment familiar to the client—the home, school, or place of work. An increasing number of third-party insurers are including outpatient coverage in their benefit packages. Additionally, with an increasing proportion of the population reaching 65 years of age, a corresponding increase is expected in the need for long-term facilities. Reimbursement programs are being developed for long-term nursing care to reduce institutional care for the elderly.

The delivery of health care services in the home is one aspect of the health care delivery process that is being fostered as an alternative to costly nursing home and extended hospital stays. Besides the presumed cost benefits, care provided in the individual's residence is believed to be qualitatively better and more humane than that typically provided in the institutional setting.[24] Given a disease or disability that is relatively stable in its course, and given a responsible "other person" within the home to render basic care, personal care and most medical services for the patient can be provided in the client's home setting. More health care will be provided to more individuals in the home setting, including attention to health maintenance and disease prevention.

New modalities of inpatient hospital services also have had an impact on the staffing and utilization of nursing personnel. Hospital services have become more sophisticated and complex, as shown by the increasing numbers of specialized units such as intensive care, cardiac care, renal dialysis, and burn care.[25] These types of hospital services, together with more expensive and sophisticated equipment, have intensified the need for staffing by a mix of nursing personnel, using registered nurses having appropriate educational preparation.[26]

The Panel made several assumptions concerning the delivery of nursing services:

1. National trends, as derived from past experiences, when applied to existing patterns of services for each state will reflect the service requirements for each state.
2. The types of facilities in which registered nurses are employed will not markedly change during the next five years, but there may be shifts in emphasis. The Panel assumed there will be more ambulatory and home care services, partly as a result of cost control in hospitals. Nurses' capabilities for providing primary health care and preventive services in ambulatory care settings have been tested and demonstrated. The greatest proportional increase in nurse manpower required for the future will be in these types of facilities.

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*"In providing such services (1) the physical, emotional, social, and economic status, as well as the cultural and environmental backgrounds of individuals, families, and communities (where applicable) are considered; (2) the client is provided access to the health care system; and (3) a single provider or team of providers, along with the client, is responsible for the continuing coordination and management of all [illegible] health services needed for individual and family care."[23]

3. Growth in facilities and nursing positions in ambulatory services and community health settings will increase beyond the current level, a factor in the extent of growth being the reimbursement mechanism.
4. The increasing complexity of nurses' responsibilities makes it necessary for registered nurses to have knowledge and competencies acquired through educational programs leading to professional degrees at baccalaureate, master's, and doctoral levels.
5. Nursing services are, in part, related to the number and distribution of physicians and other health professionals, to the accommodation of roles that occurs among health professionals in practice settings on modes of reimbursement for health services, and to the public's perception of services appropriate from nurses.
6. For the provision of some nursing services in selected areas, a staffing mix of registered nurses, licensed practical nurses, and aides is appropriate and cost effective.
7. The reimbursement mechanism will influence the number of self-employed registered nurses, whether in individual or group practice, and thereby the services available.

Nursing's Role in the Changing Health Care Scene

Changes in the organization and delivery of health care services have resulted in altered requirements related to nursing care. An analysis of nursing manpower needs must distinguish between the various current and emerging nursing roles. Nursing is often treated as a homogenous entity and is viewed from the perspective of hospital-based practice. Although most registered nurses provide direct service to patients in hospitals and nursing homes, increasing numbers of registered nurses are providing care in ambulatory care and community health settings such as physicians' offices, community health centers, community mental health centers, outpatient clinics, and alcohol and drug abuse centers. They provide nursing service to the sick and infirm at home, and to individuals in schools, occupational health settings, and correctional institutions, and to individuals who are considered as high risk. They are involved in licensure and regulation of various health care agencies. Registered nurses also work in federal, regional, state, local, national, and international health-related institutions and organizations. In these settings, registered nurses not only provide direct service to patients but also serve as administrators of nursing services and of agencies, and supervisors of nurses and auxiliary workers. A growing number of registered nurses are now moving into independent or group practice. Registered nurses also work as consultants, researchers, and instructors in various health care settings, and as faculty, researchers, and/or administrators in schools of nursing.

The above identifies a number of the various health care settings in which nursing personnel provide services. The following sections describe some of the changes in the practice of nursing and nursing's contributions to health care.

Changes in the Practice of Nursing

With the knowledge explosion in the sciences and the increase in complex and sophisticated technology and the subsequent effects on the care being offered, registered nurses require much knowledge and a high degree of skill in clinical areas. And, with an increased emphasis on primary health care, nurses are needed as primary health care providers. In response to these needs, clinical nurse specialists and nurses with practitioner skills are being prepared.

The position of clinical nurse specialist has been utilized by health care institutions and agencies to promote proficiency and effectiveness in clinical nursing. Such clinicians are prepared through a graduate degree in a nursing specialty.[27] These nurses have knowledge and skills in a clinical field that allow them to care for clients with particular health-illness problems. Examples of such specialty nursing practice groups include nurse midwives, obstetric and gynecological nurses, neurosurgical nurses, urological nurses, emergency care nurses, orthopedic nurses, pediatric nurses, and general intensive care and cardiac intensive care nurses.[28] In addition, there are nurse specialists in community health and in the care of the elderly.

Clinical specialists provide expert care to patients who present health problems and require modes of care consistent with specialized preparation. They are resource persons to other nurses, physicians, students, and their clients and work with these people in determining appropriate care and to resolve clients' problems. Clinical specialists serve as patient advocate, catalayst, and overt change agent in relation to improvements in the health care delivery system. They provide direct care to groups of patients and serve as consultants and role models. Clinical specialists practice interdependently with physicians. These nurses assume authority and responsiblity for the clinical practice of nursing in their area of expertise. Considerable evidence exists regarding the effectiveness of the clinical nurse specialist as a provider of high-quality care.[29] More clinical nurse specialists are required to meet the needs of clients in the total continuum of health and illness.

Nurses with practitioner skills are prepared to deliver primary health care. The nurse practitioner is a registered nurse who has successfully completed a formal program of study designed to prepare registered nurses to deliver such care. The nurse practitioner has the ability to:

1. Assess the health status of individuals and families through health and medical history taking, physical exmination, and defining of health and developmental problems;
2. Institute and provide continuity of health care to client (patient), work with the client to ensure understanding of and compliance with the therapeutic regimen within established protocols, and recognize when to refer the client to a physician or other health care provider;
3. Provide instruction and counseling to individuals, families, and groups in the areas of health promotion and maintenance, including involving such persons in planning for their health care; and
4. Work in collaboration with other health care provider and agencies to provide, and where appropriate, coordinate, services to individuals and families.[10]

Results from a recent study indicate the nurse practitioner movement is producing significant numbers of primary care providers for those people and those areas traditionally underserved, and that those who employ nurse practitioners are generally well satisfied with their performance.[11]

The effects of nurse practitioners in primary care practice were assessed in another study conducted in a large practice of two family physicians in suburban Ontario, Canada. A randomized trial was designed in which patients were assigned to conventional care from family physicians or care from nurse practitioners. Both groups of patients had similar morbidity experiences, and no differences were found with respect to physical functional capacity, or social or emotional function. The results demonstrated that a nurse practitioner can provide first-contact primary clinical care as safely and effectively and with as much satisfaction to patients as a family physician. Nurse practitioners were able to function alone successfully in 67 percent of all patient visits and provided a major increase in total quantity of clinical service without a reduction in quality. The results further demonstrated that the use of nurse practitioners was cost effective from a societal viewpoint.[12]

In addition to the emergence of new roles, there have been changes in staffing patterns to meet the needs of the clients more effectively and efficiently. One such pattern is the primary nursing assignment method. This, to be differentiated from primary health care, is gaining attention, and its use is growing in many hospitals. Primary nursing is a method of assignment consisting of designating a primary nurse for each patient admitted to the hospital.[13] The primary nurse assumes total responsibility for assessing and planning the patient's nursing care throughout the hospitalization experience. An associate, who may be another registered nurse or a licensed practical nurse, provides nursing care as planned by the primary nurse when the primary nurse is not in the patient setting.

Primary nursing was formulated to combat discontent with the fragmentation of care experienced when functional and team nursing assignment methods were used in hospitals. Experience has demonstrated that these latter methods may contribute to discontinuity of care, lack of planning and evaluation of results, diffusion of accountability, and excessive time required for supervision of lesser prepared nursing personnel. Staffing for primary nursing requires that registered nurses make up at least one-half the total nursing personnel staff: one registered nurse assumes the total responsibility for four to six patients.

Several studies of the primary nursing assignment method suggest promise for both cost containment and improved patient care. In one study, no increase in cost for primary nursing care staffing was reported by nine hospitals using this method of assignment as compared to the functional approach, which assigns nursing personnel to specific tasks. Nursing costs per bed per month for the primary nursing unit were $701.12, as compared to $842.79 in the unit utilizing a team of registered nurses, licensed practical nurses, and aides. Results on quality measures in this study were equal.[14]

In another study, conducted at the University of Michigan, it was shown that when primary care nursing was provided for postoperative renal transplant patients, there were fewer negative behaviors exhibited by patients, a shorter hospital stay, and fewer complications for patients.[15] In still another study, which was conducted at Children's Hospital, National Medical Center, in Washington, D.C., it was reported that nursing cost per patient day for patients receiving primary care was $30.14, as compared to $34.49 in the control setting in which nurses delivered group care, with each patient assigned to several nurses. These figures were based on total salaries per pay period divided by total patient days per same period. Additionally, the study at Children's Hospital showed that higher mean scores, which indicated higher quality of care, were obtained in the Slater Nursing Competencies Scale, the Quality Patient Care Scale, and the Phaneuf Nursing Audit on units that provided primary nursing care.[16]

These changes in the practice of nursing have implications for the preparation, distribution, and utilization of nursing personnel that are appropriate to given health care settings. The role of nurses will change substantially in that nurses will practice independently and will become more involved in decision making. With this greater degree of authority, there will be more risk taking involved and an increased awareness of accountability for decisions made and care provided. More nurses will need to have the type of academic preparation that will develop the special knowledge and abilities required to fulfill these roles.

Contributions of Nursing to Health Care

One in eight new jobs created between 1960 and 1970 was in the health industry. By 1973, approximately 2.2 million of the 4.4 million active workers estimated to be in health fields and occupations were in nursing-related services. These included registered nurses, licensed practical nurses, nurse aides, orderlies, attendants, and home health aides. Clearly, nursing personnel constitute the largest group of health workers, accounting for approximately 50 percent of the total.[37]

Registered nurses are responsible and accountable for nursing practice in a wide range of health care settings, as characterized by the following description: "the practice of nursing encompasses assessing and enhancing the general health status, health assets, and health potentials of human beings."[38] Nursing practice requires the use of judgment, knowledge, and technologies in: (1) assessing the client's health status; (2) establishing realistic health goals for individuals, families, and communities; (3) planning and implementing strategies to achieve health goals; (4) providing nursing care and treatment; (5) making needed referrals; (6) evaluating processes and outcomes of nursing care; (7) collaborating with other health professionals; and (8) guiding and directing all assisting nursing personnel while exercising appropriate judgment in these areas.[39]

A publication of the Analysis and Planning Project, *Inventory of Innovations in Nursing*, is a collection of examples of innovations in nursing care delivery and nursing education. It documents that nurses are providing a wide range of high-quality, cost-effective health care in schools, clinics, and private nursing practices, as well as in hospitals and community health settings.[40] For example, in Seattle, Washington, a clinic offers a health care program for multicultural, multilingual Asian populations through the appropriate use of registered nurses with Asian backgrounds and languages. The center is the sole source of health care for many of its clients.[41]

In other situations where physicians understand and accept the expanded role of the professional nurse, health care delivery has been found to be at least equal to and in many cases more effective in terms of cost and/or quality than the care of unassisted physicians. This has been especially true in ambulatory care settings such as clinics and health maintenance organizations, where preventive health measures and nurturance contribute to quality care and are expensive to provide predominantely with physician manpower.[42] Results from a study on nursing health assessment of preschool children at preschool registration in Perth County, Ontario, Canada, indicated that public health nurses could offer a service acceptable to parents and family physicians that was cost effective. Approximately 81 percent of the 137 parents indicated a preference for the nurse health assessment session. Some of the reasons given for the preference were: (1) the session was easier on the child than waiting in the doctor's office, (2) the child felt more at ease and relaxed in sessions with the nurse, and (3) the examination was well done and more complete. The charges per child for care provided by a public health nurse were slightly less than half that charged by the family physician.[43]

As the new and expanded roles of registered nurses become generally recognized and as nursing practice becomes increasingly sophisticated and complicated, new groups of nurses—highly specialized in certain areas of nursing practice—are appearing. They have increased ability to deal with such societal problems as alcoholism, child abuse, drug addiction, and mental illness. More nurses who are educationally prepared to assume leadership positions in the overall planning and delivery of health care services are now working in the areas of research, education, and administration. This group will continue to grow in number. Nursing practice will become increasingly research based as more nurses undertake clinical research that can be used to improve the quality of patient care.[44] Nursing now serves a significant role in the delivery of health care services; this role will increase greatly in the immediate future.

Preparation of Nursing Personnel

Over the years, education in nursing has undergone major changes. Until the mid-1950s, nearly 90 percent of nurses were prepared in hospital-based nursing schools. By 1969, 60 percent of nurses were being graduated from diploma programs. More recently, the number of diploma programs has declined substantially while the number of baccalaureate and associate degree programs has increased. Between 1964 and 1973, associate degree programs quadrupled in number because of the rapid expansion of community colleges.[45] However, the 1975 report of the National League for Nursing indicated that, after nearly 10 years of numerical expansion and growth, the trend has peaked; basic nursing programs appear to be stabilizing at a growth rate of virtually zero. Changes in types of programs are occurring in that the number of diploma programs continues to decline and the numbers of associate and baccalaureate programs continues to grow. Young persons everywhere now seek senior or junior college education after high school, showing a steadily declining interest in other programs. The practical nurse programs have also reached a virtual zero growth rate.[46]

Nursing personnel are being prepared in a variety of programs in the educational or health care system. Table VI.1 provides data on the types and numbers of nursing education programs in the United States, as well as enrollment figures. The following sections provide a brief description of the various types of programs that prepare nursing personnel.

Table VI.1

Types, Numbers, and Enrollment of Nursing Education Programs in the U.S., October 1976

Program	Number of Programs	Number Enrolled
Doctoral degree (Nursing)	14	632
Master's degree	106	10,809
Baccalaureate degree*	409	120,277
Associate degree	632	91,004
Diploma	390	56,091
Practical nurse	1,319	58,442

*Includes master's programs in basic nursing and both basic and post-RN baccalaureate programs.

Sources: NLN, State-Approved Schools of Nursing - RN, 1977
NLN, State-Approved Schools of Nursing - LPN/LVN, 1977
NLN, Some Statistics on Baccalaureate and Higher Degree Programs in Nursing, 1976-77

Graduate Degree Programs

"Graduate education in nursing embodies the characteristics of graduate education in general and the specific characteristics of professional education."[47] Graduate education in nursing is study for one of the many specialties of nursing and is pursued after the baccalaureate in nursing degree (or a basic nursing master's program). Such study is undertaken at an institution of higher learning that offers major programs leading to the awarding of a master's or doctoral degree. The master's degree is expected to be in nursing. At present there are 14 graduate programs that offer the doctoral degree in nursing. Because doctoral programs in nursing are relatively new, most registered nurses with doctoral preparation hold degrees in related disciplines such as anthropology, sociology, psychology, education, physiology, and microbiology.

The characteristics of graduate education in nursing include specialization in a clinical area of interest, mastery of knowledge in that area, freedom of inquiry in the pursuit of knowledge, acquisition of skills, and competence in research. Programs are designed to prepare nurses who will be capable of improving nursing care through the advancement of nursing theory and science. These nurses will influence also the practice and study of nursing by generating higher levels of competence, and by teaching, administering, and investigating professional practice. Professional career development includes both clinical aspects and functional preparation in administration, supervision, or teaching.

The graduate of the program is a critical and self-directed clinician, an effective professional leader, and a productive contributor to the nursing profession. The nurse in the advanced professional program is one who: (1) pursues an area of clinical specialization, (2) elects an area of role development, (3) develops and tests nursing theories, (4) advances knowledge in the field through systematic observation and experimentation, (5) relates basic science theories to the development of knowledge in clinical and functional areas, (6) identifies and implements nursing's leadership role within the delivery of health care services, and (7) engages in a collaborative role with others interested in health care.[48]

Post-RN Baccalaureate Programs

Many registered nurses who were prepared in diploma or associate degree programs have found it necessary, both for their own professional satisfaction and to meet job specifications, to attend a senior college or university to fulfill the academic requirements for a baccalaureate degree. Many of these nurses enroll in the initial or basic baccalaureate programs. Others enroll in programs developed just for registered nurses.[49]

Although basic baccalaureate degree programs in nursing require approval of a state agency, programs specifically for registered nurses are not required to be so approved; currently there are 50 such programs. The numbers of enrollments in and graduates of post-RN baccalaureate programs continue to grow. In 1977, there were 3,790 RNs graduating from these programs—a 26 percent increase over the number graduating in 1976.[50]

Basic Preparation of Registered Nurses

There are now four types of educational programs that prepare persons for licensure as registered nurses: (1) hospital programs leading to a diploma, (2) community and junior college programs leading to an associate degree, (3) college and university programs leading to a baccalaureate degree, and (4) master's degree programs in basic nursing.

Diploma Programs: Historically, the diploma program in nursing has been, until recent years, the route to preparation for nursing. Operated by hospitals, these schools serve the interest and goals of qualified students desiring an education centered in a health institution, whose prime purpose is the care of patients. The school is operated by a service agency that provides a readily accessible hospital clinical laboratory for learning. The school may enter into cooperative relations with colleges or universities for educational courses and/or services.

The curriculum is designed to develop the knowledge and skills essential for beginning practice as a registered nurse. The curriculum includes courses in nursing, as well as courses in the biological, physical, and behavioral sciences. Learning is reinforced through application of scientific and nursing principles in the care of individuals and groups having nursing and health needs. Clinical practice is primarily in hospitals with some observation and/or limited practice in extra-hospital health services. The program generally is two or three years long and is approved by state agencies.[11] Graduates are eligible to take the State Board Pool Examination.

Associate Degree Programs: Associate degree education in nursing is an established part of the system of higher education in the United States. Three-quarters of the programs are located in community or junior colleges, with the remaining quarter in senior colleges or universities. Associate degree nursing education provides both general and technical education for the individual who will contribute to the provision of nursing services in society. The program of learning is usually organized for completion within a two-year period, with experience during that period in caring for moderately ill patients in general hospitals. The program meets the requirements of the parent institution for granting an associate degree and of the state licensing agency for eligibility to take the State Board Test Pool Examination.[12]

Baccalaureate Degree Programs: The baccalaureate program in nursing is offered by an institution of higher education. The structure of this program usually follows the pattern of other baccalaureate programs in the same college or university. It is characterized by lower and upper divisions of study. The lower division includes foundation courses in the physical and behavioral sciences, the humanities, and general education. Building on the foundation courses, the upper division concentrates on study in the professional nursing major and includes courses that complement the major and increase the depth of lower division work. Learning experiences are provided to enable students to acquire: (1) ability to assess nursing needs and provide nursing intervention; (2) knowledge of developing theories and practices in nursing; (3) competency in selecting, synthesizing, and applying relevant information from various disciplines; (4) ability to evaluate current practices and try new approaches; (5) competency in collaborating with members of other disciplines and with consumers; (6) knowledge of the broad function that the profession is expected to perform in society; and (7) foundation for graduate study in nursing. Clinical experience encompasses care of acutely ill patients in hospitals, ambulatory patients in clinics, and clients who use community health agencies, home nursing services, and nursing home facilities. Programs are approved by state agencies, and graduates are eligible to take the State Board Test Pool Examination.[13]

Nurses prepared at the baccalaureate level provide within the health care system a vital, dynamic, and evolving service that maintains and promotes the health of individuals and groups. Such nurses are accepting a greater share of responsibility in the provision of health care services, are developing more productive methods of working interdependently with other health professionals, and are moving toward the advocacy role in relation to clients. They practice in a variety of health care settings. The practice is culturally acceptable; emphasizes comprehensive health care of individuals with acute and long-term illness; and includes prevention, rehabilitation, health counseling, and education.

Master's Programs in Basic Nursing: A few senior colleges and universities offer master's degree programs leading to the initial professional degree in nursing for college graduates entering with no previous preparation in nursing. The program is generally two years in length and is approved by state agencies as a program preparing graduates for beginning nursing practice. Graduates of these programs have competencies in nursing comparable to those expected of graduates of basic baccalaureate degree programs. Graduates are eligible to take the State Board Test Pool Examination leading to licensure as a registered nurse.

Continuing Education and Certificate Programs

With the knowledge explosion in the sciences and health care, continuing education of all health professionals is needed if they are to keep abreast of latest developments. Continuing education comprises educational opportunities outside the institution or agency, usually planned by a nursing organization, university, hospital, or health department. Courses are offered on either a credit or noncredit basis, and some may be applicable toward a nursing degree. The issue of whether continuing education should be required for maintaining a license to practice is currently under debate. As of 1978, 10 states (California, Minnesota, Florida, Kansas, Colorado, Iowa, Kentucky, Massachusetts, Michigan, and New Mexico) have enacted legislation requiring mandatory continuing education.*

Certificate programs have been established to prepare nurse practitioners. Currently, there are approximately 200 certificate programs that offer specialization in the following areas: pediatrics, midwifery, maternity, family, adult, and psychiatric, and school and college health practice. These programs provide preparation in taking health histories, physical examinations, ordering laboratory tests, and assuming responsibility for management of selected cases.[14] Although many of these programs ostensibly prepare for the same functions, experience is showing that preparation should move into the mainstream of graduate education. It is the Panel's position that the time span for the continuation of certificate programs not now at the master's level should be limited to not more than five years.

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*Personal communication, Colorado Nurses' Association, May 1978.

In October 1976, the American Nurses' Association (ANA) commissioned a 22-month comprehensive study to address the issues regarding licensure, certification, accreditation, and credentialing. Future directions and recommendations concerning resolution of these issues facing nursing will be made as a result of this ANA study.

Preparation of Practical Nurses

Programs preparing practical or vocational nurses generally are offered by public vocational educational systems or by hospitals. They are usually one year in length and lead to a certificate or diploma in practical nursing. Planned learning experiences are directed toward performing common nursing measures with skill and efficiency, consistent with current nursing concepts and practices. Clinical practice experience is primarily devoted to care of patients in hospitals who are in subacute or convalescent phases. Communication skills and mental health concepts are included in the curriculum. Practical nursing programs are approved by state agencies. State laws require graduates to pass state licensing examinations to practice as licensed practical nurses and require that practical nurses function under the supervision of registered nurses or physicians.[11]

Preparation of Nursing Aides

Preparation of nursing aides or assistants (terms that include aides, orderlies, attendants, and home health aides) generally takes place through on-the-job training in the employing institution or community agency. A few programs exist in which training occurs in vocational education systems or in community college programs. The training period is generally six weeks in length. Some programs have 120 hours of classroom instruction and 80 hours of clinical practice. Individuals completing the program are able to assist registered nurses in limited patient-related activities under appropriate supervision. These training programs are neither state approved nor accredited, and the trainees are not subject to licensing following completion of training. In some states, special state-approved programs for psychiatric aides/technicians lead to examination and licensure.

Chapter VI.4

The State Model Approach

Overview of the State Model Approach

The State Model[16] provides an analytical framework for projecting nursing supply and requirements one to five years into the future. The process consists of five major steps that identify the key variables and decision points the user must address in making the requirements projections. These steps include:

- Differentiating the client population
- Assessing the health care needs of each population grouping
- Formulating health care goals and priorities for each population grouping
- Estimating health program and service requirements
- Estimating appropriate staffing patterns

Figure VI.1 provides an overview of the State Model nursing requirements projection scheme. An inherent part of the planning process in using the State Model is the convening of a group of experts to provide the assumptions, estimates, and criteria. This panel should include representatives from nursing, education and health planning, and other groups as identified by the sponsoring agency.

An advantage of the State Model approach is that any group using the model can determine its own assumptions, estimates, and criteria for each of the key variables and decision points and can assess the impact and relationships of alternative assumptions, estimates, and criteria. The model is easily understood and can incorporate state and substate characteristics.

In using the State Model to make national and state-by-state estimates of nursing requirements, the Panel of Expert Consultants made assumptions concerning the composition of the population, the health care needs, and the health goals. Estimates of required services were projected on the basis of the Panel's underlying assumptions. Criteria were established for staffing patterns for nursing personnel and for educational preparation of registered nurses to meet required services. Quantitative relationships were specified and used to facilitate the decision-making process as a result of the Panel's assumptions, estimates, and criteria. These relationships were formulated with respect to population, health services, and nurse staffing considerations.

For example:

Number of patients in hospital

$$= \text{population} \times \frac{\text{beds}}{\text{population}} \times \text{occupancy rate}$$

Number of FTE* RNs needed

$$= \text{number of patients} \times \text{RN staffing ratio}$$

Number of FTE LPNs needed

$$= \text{Number of FTE RNs needed} \times \frac{\text{LPN}}{\text{RN}}$$

Number of FTE aides needed

$$= \text{Number of FTE RNs needed} \times \frac{\text{aide}}{\text{RN}}$$

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*FTE = Full-time equivalent. All projections have been made in terms of full-time equivalent (FTE) positions. FTE positions are based on full-time positions plus one-half the part-time positions.

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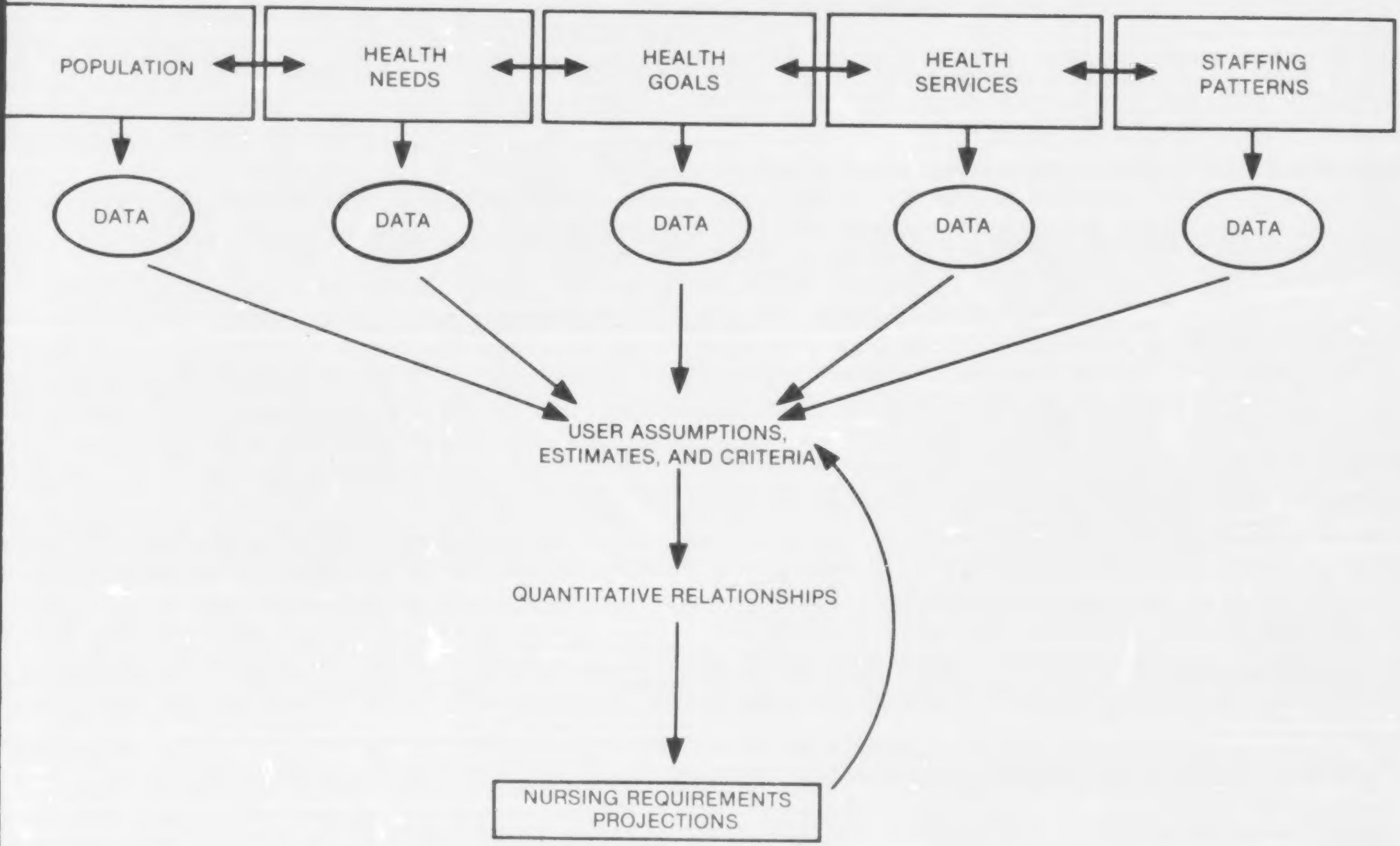
POPULATION
HEALTH NEEDS
HEALTH GOALS
HEALTH SERVICES
STAFFING PATTERNS
DATA
DATA
DATA
DATA
DATA
USER ASSUMPTIONS, ESTIMATES, AND CRITERIA
QUANTITATIVE RELATIONSHIPS
NURSING REQUIREMENTS PROJECTIONS

OVERVIEW OF NURSING REQUIREMENTS PROJECTION SCHEME*

Figure VI.1

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*Overview of Nursing Requirements Projection Scheme as modified by the Panel of Expert Consultants.

The Panel made several iterations of its projections until an acceptable set of assumptions, estimates, and criteria was obtained to project nursing requirements. The goal was to arrive at projected requirements that would improve access to nursing services, be cost effective, and provide quality nursing care. The Panel's assumptions, estimates, and criteria were based on but not limited to accepted standards and current practice. In less defined areas, the Panel used its collective wisdom and expertise in making its decisions. In specifying staffing patterns, the Panel proposed lower and upper bound criteria as a guide for planning. It applied its staffing ratios and the educational criteria to total U.S. data** in projecting nursing requirements nationally and to state data** in projecting nursing requirements on a state-by-state basis. The state data took into account existing trends in population, health services, and occupancy rates specific to each state.

The Panel stated that the criteria are not standards and anticipates that by 1982 all states will have achieved at least the lower bound estimates and many will meet or exceed the upper bound.

The remainder of this chapter contains the details of the Panel's deliberation on the key variables and decision points and the resulting nursing requirements projections.

Key Variables and Decision Points

Differentiating the Client Population

The first decision point in the requirements planning process dealt with the population to be served. Data on key demographic variables, such as age, race/ethnicity, sex, income, educational attainment, and occupation, all of which have impact and implications for health care, were considered. The decision point related to how the population should be differentiated so that its health needs might be better assessed. In Chapter VI.3 discussions on the health status of the population gave examples of how these demographic characteristics are associated with particular health needs. A major purpose in reviewing these data was to identify which health needs are unmet and which specific population subgroups are especially affected. In assessing the health needs of the population, the Panel examined differentiating characteristics of the client population from profile data made available by the data base and related these to health needs for selected demographic groupings in the population.

Assessing the Health Care Needs of Each Population Grouping

Closely allied to differentiating the population is the assessment of the health status of the population in terms of quantitative health status indicators. These included a variety of possible health status indicators, including morbidity, mortality, and natality statistics. The decision point related to the particular data to be examined and how they were to be interpreted.

Formulating Health Care Goals and Priorities for Each Population Grouping

The next decision point is related to the identification of a specific set of health goals, or, if general health goals have already been identified, casting them into a more concrete form for planning purposes. These goals provide the basis on which subsequent decisions about health services and nursing utilization could be made. Very limited quantitative data are available at this point. However, national priorities established by federal legislation provide relevant background material. Besides providing for more focused planning and facilitation program accountability, goal-oriented planning affords a feasible opportunity for consumer input into the planning process. The Panel emphasized a wellness-preventive orientation in health planning and assumed an increase in ambulatory outpatient and community-based services. The Panel also stressed the need for a marked increase in nursing services to the elderly.

Estimating Health Program and Service Requirements

Once health goals were determined, the question of programmatic direction was considered. Health programs may be viewed in terms of inpatient, ambulatory, emergency, and outreach service, or in terms of prevention and detection, diagnosis and treatment, habilitation and rehabilitation, and maintenance or support services.

In conceptualizing health programs and mix of nursing services, the Panel established the following categories of health services. Inpatient services were differentiated and grouped according to criteria that the Panel agreed would have an impact on differential staffing patterns. Hospitals were classified as long-term or short-term institutions. Within the long-term hospitals, the Panel specified two subcategories: psychiatric hospitals and all other long-term hospitals. Short-term hospitals were categorized into small hospitals (less than 100 beds), large teaching hospitals (more than 400 beds), and all other hospitals. Specific units specified within the hospitals by classification included: general (including adult medical/surgical, pediatrics, and maternity units), critical care, self care, extended care, rehabilitation, psychiatric, and newborn units. Other hospital services providing nursing care listed by the Panel included operating rooms (surgical operations), emergency services (emergency visits), and outpatient

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** The variety of data sources used by the Panel is outlined in Appendix C.

clinics (visits).

In making projections for inpatient services, the Panel assumed the bed-to-population ratio would stabilize at the current ratios. Occupancy rates based on actual 1975 state-by-state figures were used for projecting requirements to 1982 for each state. The Panel projected the trend toward a stabilized utilization of hospital beds being brought about by Professional Standards Review Organizations, the use of health maintenance organizations, and the limitation of hospital costs by federal legislation.

Nursing homes were divided into two categories: nursing care homes and personal care homes with nursing. The Panel recognized that any increase in the number of hospitals in all categories, including nursing homes, would be affected by certificates of need.

Nursing services in community health were viewed from five perspectives: home visiting for home health care and/or general public health, clinics, school health, occupational health, and other services such as regulatory and licensure programs.

Additional categories providing services included physician's offices and private duty and other health-related organizations.

Estimating Appropriate Staffing Patterns

The final set of decisions dealt with the numbers and kinds of nursing personnel required to provide health services. Additionally, in the nurse staffing area, attention was given to the crucial issues facing the nursing community relating to the educational preparation of registered nurses and the expanded roles for nurses. The roles of nurses practitoners and clinical nurse specialists were also considered. The Panel recognized the roles of other health professionals in the delivery of health care. Data and time constraints precluded the full assessment of the impact of other health professionals on the number of nurses projected.

In recognition of local and regional geographic differences and institutional variables that have an impact on staffing requirements, the Panel agreed that a range of staffing should be proposed as a guide for planning, and described this as lower and upper bounds. Thus, the projections show a range. In projecting nursing requirements the Panel made recommendations about: (1) the overall staffing levels required; (2) the desired mix among RNs, LPNs, and aides; and (3) the desired mix of RNs at the associate degree/diploma (AD/DIP), baccalaureate, and advanced degree levels of preparation.

The following sections give a general overview of the assumptions, estimates, and criteria considered by the Panel in its requirements projections on staffing and educational preparation. It is the Panel's expectation that there will continue to be variation among states, but that most states will move toward meeting or exceeding the upper bounds of the requirements projected.

Assumptions, Estimates, and Criteria: Staffing Patterns

The Panel reviewed studies that evaluated quality of care and the implications from those studies for projecting nursing requirements. Studies of staffing and quality of care that are beginning to appear in the literature identify variables that related to quality. Scott, Forrest, and Brown examined the influence of the qualifications of staff on the quality of care in a study of outcomes of surgical patients.[17] The study was based on a sample of 8,593 patients in 17 hospitals. Data were obtained on patient, hospital and staff characteristics. Results on staff qualifications indicated that the higher the ratio of registered nurses to licensed practical nurses on surgical units, the better the quality of care. Additionally, the higher registered nurse ratio was positively correlated with decision making at the unit level rather than at the level of the central nursing administration. The higher registered nurse ratio was also positively associated with the standardization of nursing procedures and with the use of higher ratios of clerk and secretaries on the wards. Both of the latter two measures of ward organization are positively associated with quality of care.

A study of Rush-Presbyterian-St. Luke's Medical Center in Chicago, Illinois, also focused on a methodology for monitoring quality of nursing care.[18] Numerous variables were found to be related to quality; the variable showing the greatest influence was the unit organizational structure. Although no single set of variables provided a definitive explanation of the variation in quality scores, the major explanatory variables were observed to be staff mix on the unit, number of patients, and type of nursing organization.

Another study, conducted at San Joaquin General Hospital in Stockton, California, examined methods of staffing, utilization, and effectiveness of nursing personnel. It was shown that the relationship of staffing to quality is very complex.[19] Results showed that a reduction of the perceived quality of nursing care, increased waiting time, and increased use of analgesics were related to staffing inadequacies. The categories of care affected by reduced staffing included communication with the patient and his family and nursing surveillance.

In relation to cost effectiveness, Christman and Jelinek questioned the continued use of old staffing patterns, which require large amounts of the time of highly paid professionals in the orientation, inservice, education, and supervision of low-skilled personnel.[20] The increasing number of articles on the primary nursing care assignment for hospital staffing likewise reflects the implementation of this new approach to nurse staffing. Additionally, the American Nurses' Association has established standards for the various fields of nursing practice that should assist in evaluating staffing patterns.

On the basis of its review and findings and its intent to improve the quality of care, the Panel projected a different mix of nursing personnel, within the overall staffing levels required, than that currently existing in most agencies. In making its projections for an increase in RN staffing and the educational preparation of RNs, the Panel took into account three factors: the number of tasks that can be assigned to other workers, the number of LPNs and aides that an RN can supervise, and the number of patients for whom an RN can care. The Panel utilized accepted standards in current practice where these existed and proposed criteria for staffing and educational preparation on the basis of its collective expertise when previous guidelines were unavailable.

Inpatient Services (Hospitals)

The Panel made its projections on the basis of the following assumed conditions: (1) that nurse staffing for a group of patients requires nurses on three shifts for each day; (2) that one FTE nurse will work 1,800 hours per year on the average; (3) that 4.9 FTE nurses are required to provide one nurse for each of the 21 shifts per week, based on the 1,800 hours of work (which allows for the standard work week and holidays, vacation, and actual sick leave taken); and (4) that 20.3 FTE RNs per 100 patients will give one nurse hour for each patient day.

The figure of 1,800 hours was a weighted average of the estimated number of hours worked per year, which the Panel adopted, based on surveys by the Bureau of Labor Statistics in selected standard metropolitan statistical areas. The figure corresponds to 45 working weeks, or 225 working days per year.

The derivation of FTE RNs necessary to provide one RN on each shift is as follows:

$$\text{21 shifts/week} \times \text{52 weeks/year} = \text{1,092 shifts/year}$$

$$\text{1,800 hours/FTE RNs/year} \div \text{8 hours/shift} = \text{225 shifts/FTE RNs/year}$$

$$\text{1,092 shifts/year} \div \text{225 shifts/FTE RNs/year} = \text{4.9 FTE RNs}$$

From 1969 to 1975, using the index of intensity, it is reported that there has been a 32.1 percent increase in acuity.* The staffing recommended for general units (adult medical/surgical, pediatrics, and maternity) reflects the identified need for professional nursing services to meet the increase in the acuity of patient conditions. Patient teaching is another major component. Thus, a staffing pattern to assure this aspect of care is essential.

The Panel agreed that the same staffing patterns for nursing care on general units is required on rehabilitation units and normal newborn units. For rehabilitation, patients require therapeutic measures to promote return to optimal functioning and thus require nursing staffing patterns comparable to those of acute care. Within a newborn nursery, there is also the potential of emergency situations requiring the immediate application of professional nursing judgments.

The Panel indicated that in hospitals of less than 100 beds, the patient conditions vary considerably. A staffing pattern sufficient to meet any problem is required. Thus, the Panel recommended the same criteria for all units in a hospital of less than 100 beds as those recommended for general units in larger hospitals.

The Panel contended that patients in long-term psychiatric hospitals should receive nursing care beyond that of mere custodial care, whereas patients in acute psychiatric hospitals require more intensive nursing care.

Critical care units require intense, complex, and sophisticated nursing care. At times, some patients require continued surveillance and direct nursing care on a one-to-one basis. Patients in extended care units, however, are more self-sufficient and require less complex care. The Panel assumed that self-care units will phase out during the next five years, to be replaced by ambulatory care services.

Other Hospital Services

Other hospital services defined by the Panel included those provided for surgical operations, emergency visits, and outpatient clinics. Projections for services for surgical operations are based on the number of surgical operations. The Panel projected a steadying of the rate of surgical operations; a more effective review of the need for surgery will reduce the number of unnecessary procedures. Those surgical procedures performed will increase in complexity. Although "surgicenters" will not directly influence the number of surgical operations, they will influence the location of surgical procedures, possibly reducing the rate of hospital admissions.

Projections for nursing personnel in hospital emergency rooms and outpatients clinics are based on the projected number of visits anticipated. Using the figure of 1,800 hours of work per year, the Panel projected a lower range of requirements based on 20 visits per eight-hour day per FTE RN (or 4,500 visits per year), and an upper range of requirements based on 10 visits per eight-hour day per FTE RN (or 2,250 visits per year). The Panel projected that the number of outpatient clinic visits an RN can manage range from 20 to 40 visits per day (or a range of 4,500 to 9,000 visits per year). Allowing one hour for each new patient visit a nurse practitioner could service 8 to 12 per day (or a range of 2,000 to 2,700 visits per year).

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*Written communicaton from Dr. Joseph Phillip, American Hospital Association, 1977.

Nursing Homes

Nursing homes were classified into two categories: nursing care homes and personal care homes with nursing. A nursing care home is a facility in which 50 percent or more of the residents receive nursing care and which employs a registered nurse or licensed practical nurse at least 35 hours per week. Personal care home with nursing refers to a facility in which some but fewer than 50 percent of the residents receive nursing care. The Panel assumed the trend would continue to show a marked increase of nursing homes during the next five years because of the increased pressure on hospitals to discharge patients earlier, the trend toward an increasingly older population, and the present deficiency in the numbers of nursing home beds.

At present, nursing care activities in nursing care homes and personal care homes with nursing are primarily custodial. The Panel projected a substantial increase in staffing in nursing care homes to provide care that is therapeutic.

Physicians' Offices

The Panel believed that the overall numbers of RNs working in physicians' offices will not change markedly. However, the Panel envisioned a shift in the educational preparation of RNs in that there will be an increase in the numbers of nurse practitioners working collaboratively with physicians in newly defined roles and a concomitant decrease in RNs not prepared as nurse practitioners working in physicians' offices. Registered nurses are also being employed in health maintenance organizations.

Community Health (Public Health)

The public health community health nursing sector provides nursing services within five areas: home visiting, clinics, occupational health, school health, and other services such as regulatory and licensure programs. The Panel projected an increase in all activities within community health nursing in order to meet the needs for health education, health promotion and maintenance, and disease prevention for the 90 percent of the population that can be served outside institutional settings, in the home, school, clinic, or place of work, in a cost-effective manner.

Requirements for community health nurses have traditionally been calculated on a nurse-to-population ratio. This method did not take into account such factors as the ages within the population, the differences in the amount of care required by individuals in various population groupings and with specific health problems, and the varied distances nurses had to travel to provide care. The members of the Panel, in consultation with several community health nurses throughout the country, developed a new approach to determine staffing requirements to meet community health needs. The criteria take into account the client population through specific consideration of: (1) the number of patients discharged from hospitals who will need home visits, (2) the number of persons age 65 and over, (3) the number of persons who are in various high risk groups, (4) the size of the work force, and (5) the size of the school-age population. The minimum and maximum number of visits per day a nurse can make was determined.

Following is a brief description of how the requirements for community health nurses were determined. The detailed assumptions, rationale, and estimates are documented in Appendix D, Part 1. The calculations are in Appendix D, Part 2.

Home visits are differentiated into two categories: home health care and general public health. Home health care is that component of community health nursing that provided skilled nursing care to patients who are homebound or to ambulatory patients who can be most appropriately served in their place of residence. In making these requirement projections, the Panel considered the number of hospital discharges and the number of persons age 65 and over.

General public health (general home visits) is concerned with case finding in the community as a means of identifying and pursuing individuals and groups who are high risk and providing them with preventive, evaluative, and follow-up care in the home. In making these projections, the Panel considered such factors as: number of live births; infant deaths; number of mothers without prenatal care; and number of persons with tuberculosis, hepatitis, and other chronic illnesses.

Occupational health nursing focuses on the health of the worker, promotion of safety and health, and care for illnesses and injuries occurring at the place of work. In making its projections for occupational health nursing, the Panel considered the size of the work force.

School health nursing is concerned with health education; guidance and counseling; and providing links between teachers, parents, and other health providers in interpreting the health needs of school children. The school-age population was considered in projecting requirements for school health nurses.

Nursing services in clinics provide health assessment and maintenance to ambulatory individuals with acute conditions, exacerbations of chronic conditions, and subacute/stabilized chronic conditions. The number of community health nurses needed in the clinics (including mental health centers) can be based on an estimate of the number of clinic visits when such data are available.

The Panel considered requirements for registered nurses in other settings such as correctional institutions, and in regulatory and licensure programs. As data become available, the Panel believes projections for requirements in these areas should be made.

As consumers increasingly recognize the value of nursing care in relation to health promotion, nurses will be employed routinely as primary care providers at places of work, in schools, and in correctional institutions.

The previous sections provided information on direct client care providers within inpatient services, other hospital services, nursing homes, physicians' offices, and community health. The next four sections provide information on nurses who serve in the roles of nurse practitioners, clinical specialists, administrators, and inservice instructors, researchers, and consultants.

Nurse Practitioners

The earlier discussion on the nurse practitioner in this report highlights and documents the significant contributions made by this group of registered nurses in the delivery of primary health care to persons in need of such services in a less costly manner. The Panel therefore projected a complement of nurse practitioners in hospital ambulatory care, physicians' offices, and community health agencies as a percentage of the total number of registered nurses projected for these settings. The Panel stated that nurse practitioners could make a significant contribution to client care in nursing homes. It was recommended that 40 to 50 percent of the clinical specialists in nursing homes be nurse practitioners. The Panel recognized that some nurse practitioners are establishing independent practice as individuals or groups. Although the numbers may increase by 1982 they will remain a very small portion of the total number of nurses required. Consequently, the Panel did not make requirement projections for nurses in independent practice.

Clinical Nurse Specialists

The panel reviewed material documenting the emerging and expanding role of clinical nurse specialists and their significant contributions toward the improvement of quality care in various clinical nursing settings. Thus, the Panel agreed that a sizeable number of clinical nurse specialists will be required in addition to the other registered nurses involved in direct client care.

Administrators

The Panel recognized the fact that many nursing services are provided within complex organizations and so require appropriate numbers of nursing personnel to carry out administrative and supervisory functions. These administrative positions were viewed in two components: (1) executive/principal administrator positions, which include directors, associates, and assistant directors of nursing; and (2) midlevel nurse administrator/manager positions, which include supervisors and head nurses.

Inservice Instructors, Researchers, and Consultants

The Panel envisioned a continuing need for inservice instructors to orient new staff and to assist nursing personnel in keeping up to date with the latest developments in knowledge and technical advancements in nursing. The Panel also saw a similar continuing need for researchers to engage in clinical nursing research as a means of advancing scientific knowledge within nursing and as a way of improving patient care, as well as providing adequate consultation.

The following three sections address requirements for school of nursing, private duty, and health-related organizations.

Schools of Nursing

The number of faculty required in a school of nursing is dependent on admissions and enrollments in the various nursing programs and the student-faculty ratio projected for each program. The Panel assumed the present trend in enrollments in various nursing programs will continue during the next five years; for example, there will be a marked decrease in enrollments in diploma programs and a marked increase in enrollments in baccalaureate degree programs.

Considerable and varied experiences in the clinical settings are an essential component of all programs. To assure safety of client care and promote learning, the number of contact hours required exceeds those required in other laboratory courses. Close and careful supervision is required in working with students caring for patients and clients in hospital and community settings. Many students in baccalaureate degree programs are involved in beginning investigative studies that require faculty supervision. In establishing the faculty-to-student ratios in graduate programs, the Panel was aware of the close supervision required in working with graduate students who are engaged in research as well as in testing nursing therapies in the patient setting. It is expected that, within the faculty/student ratios proposed by the Panel, faculty members will have the opportunity to engage in research as an integral part of their overall faculty responsibilities.

Private Duty

The number of private duty nurses has been decreasing over the years as hospital units in intensive care and coronary care have become organized to assume increasing responsibility for care of the critically ill. The Panel made the assumption that this trend will continue.

Health-Related Organizations

Nurses are employed by professional nursing organizations, as well as by local, state, regional, national, and international health-related organizations. The Panel projected a continuing need for nurses in these settings.

Assumptions, Estimates, and Criteria: Educational Preparation

As the degree of complexity of care has increased, the responsibilities, knowledge, and skills required by nurses have concomitantly increased. The Panel believes that, as more registered nurses are involved in providing direct nursing services to clients, with a smaller number of prepared nursing personnel whose capabilities are circumscribed and who require extensive experience, the cost of nursing services will decrease because services will be provided more efficiently. The Panel further held that, as the ratio of baccalaureate nurses to associate degree and diploma RNs is increased, the quality of care will also increase. As a consequence, larger numbers of RNs need the knowledge and competencies acquired through educational programs leading to degrees at the baccalaureate, master's, and doctoral levels. The data from 1950 to 1976 show an increase in the percentage of nurses holding baccalaureate and higher degrees. By 1976, the percentage of nurses with graduate degrees equalled that set by the Surgeon General's consultant group for 1970. In 1976 the baccalaureate percentage was slightly over the 1970 minimum goal. However, these percentages are still below the 24 percent for the baccalaureate and 12 percent for graduate preparation that the Surgeon General's Group identified as the real need for 1970.[61] The present shortage of nurses prepared at baccalaureate and graduate levels, together with the increased need for such nurses to work in all areas except private duty, indicates that efforts must be made to prepare more nurses with baccalaureate, master's, and doctoral degrees.

In making its projections, the Panel combined associate degree and diploma graduates into a single category because of the similar competencies of these graduates. Nursing care services with standardized nursing protocols may be staffed by registered nurses prepared at associate degree and diploma levels. Where nursing care is less routine and standard, and where outcomes are less predictable, nursing services need to be staffed with registered nurses prepared at the baccalaureate and higher degree levels. The Panel projected that educational preparation for all clinical nursing specialists be at the graduate level.

The Panel proposed that preparation for midlevel nurse-administrators/managers (head nurses and supervisors) be minimally at the baccalaureate level with movement toward a master's preparation. All executive/principal nurse administrators (directors, associates, and assistant directors of nursing) should be prepared at graduate levels. Inservice instructors should hold at least a master's degree.

All faculty in schools of nursing should be prepared at the graduate level. The Panel recommended that faculty teaching in practical nursing programs and having the baccalaureate degree as their highest educational credential should have additional preparation in teaching strategies, in curriculum development, and in evaluation of students' achievements and outcomes of nursing practice.

Table VI.2 provides a detailed description of the Panel's criteria for nurse staffing and educational preparation of registered nurses in various fields of practice. Table VI.3 provides the data on the conversion of staffing ratios to hours of nursing care for various units within hospitals and for nursing homes.

Table VI.2
Panel of Expert Consultants' Criteria for Nurse Staffing and RN Educational Preparation

Field of Employment	Criteria for Staffing						Criteria for RN Educational Preparation			
	Lower Bound			Upper Bound			Doct. (%)	Master's (%)	Bacc. (%)	AD/DIP (%)
	RNs	LPNs	Aides	RNs	LPNs	Aides				
	Per 100 Patients			Per 100 Patients						
INPATIENT SERVICES										
General units*	49.0	12.0	12.0	56.5	12.0	12.0			50	50
Rehabilitation units	49.0	12.0	12.0	56.5	12.0	12.0			50	50
Newborn units	49.0	12.0	12.0	56.5	12.0	12.0			20	80
Critical care units	200.0	0.0	0.0	250.0	0.0	0.0			50	50
Extended care units	20.0	20.0	20.0	30.0	20.0	20.0			50	50
All units in hospitals under 100 beds	49.0	12.0	12.0	56.5	12.0	12.0			50	50
Long-term hospitals (psychiatric)	13.0	10.0	30.0	22.0	10.0	30.0			50	50
Psychiatric units in all short-term hospitals	49.0	00	24.0	56.5	0.0	24.0			50	50
OTHER HOSPITAL SERVICES										
Operating room	1.5 RNs per 1000 operations (10 RNs/0 LPNs/3 Aides)			1.8 RNs per 1000 operations (10 RNs/0 LPNs/2 Aides)						100
Emergency room	0.22 RNs per 1000 visits (10 RNs/10 LPNs/10 Aides)			0.44 RNs per 1000 visits (10 RNs/10 LPNs/5 Aides)					50	50
Outpatient clinics	0.11 RNs per 1000 visits (10 RNs/10 LPNs/10 Aides)			0.23 RNs per 1000 visits (10 RNs/10 LPNs/5 Aides)				10	80	10
	RNs	LPNs	Aides	RNs	LPNs	Aides				
	Per 100 Patients			Per 100 Patients						
NURSING HOMES										
Nursing care homes	9.0	23.0	23.0	20.0	40.0	40.0			50	50
Personal care homes with nursing	5.0	10.0	20.0	5.0	10.0	20.0			50	50
PHYSICIANS' OFFICES	2.0 RNs per 10 MDs (10 RNs/3 LPNs/0 Aides)			2.2 RNs per 10 MDs (10 RNs/2 LPNs/0 Aides)				25	25	50
COMMUNITY HEALTH										
Home health care	See Appendix D for detailed criteria							10	75	15
General public health								10	90	
Clinic								10	75	15

*General units includes adult medical-surgical, pediatrics, and maternity

Table VI.2 (Continued)

Field of Employment	Criteria for Staffing		Criteria for RN Educational Preparation			
	Lower Bound	Upper Bound	Doct. (%)	Master's (%)	Bacc. (%)	AD/DIP (%)
Mid-level Nurse Administrators/ Managers[5]						
All hospitals	1 Head nurse per 30 patients			25	75	
All hospitals	1 Supervisor per 100 patients			25	75	
Nursing care homes	1 RN per 10 DCC RNs			25	75	
Personal care homes with nursing	0.5 RN per 10 DCC RNs			25	75	
Community health nursing	1 RN per 10 DCC RNs			25	75	
INSERVICE INSTRUCTORS						
Short-term, large, teaching hospitals	3 RNs per institution	6 RNs per institution		100		
Nursing homes & all other hospitals	0.5 RNs per institution	1 RN per institution		100		
Community health nursing	0.5 RNs per agency	1 RN per agency		100		
RESEARCHERS AND CONSULTANTS	0.1 RN per 10 DCC RNs	0.3 RN per 10 DCC RNs	50	50		
SCHOOLS OF NURSING						
Administrators	1 per school and 1 per program (first 200 students), and					
Doctorate, master's, baccalaureate	1 per each additional 200 students[6]		100			
Associate, diploma			25	75		
LPN				100		
Faculty						
Doctorate	1 RN per 6 students	1 RN per 4 students	100			
Master's	1 RN per 6 students	1 RN per 4 students	75	25		
Baccalaureate	1 RN per 8 students	1 RN per 6 students	20	80		
Associate	1 RN per 10 students	1 RN per 8 students	10	90		
Diploma	1 RN per 10 students	1 RN per 8 students	10	90		
LPN	1 RN per 10 students	1 RN per 8 students		60	40	
PRIVATE DUTY	1 RN per 10,000 population	0.9 RN per 10,000 population[7]			20	80
HEALTH-RELATED ORGANIZATIONS	0.4 RN per 10,000 population	0.5 RN per 10,000 population	10	90		

National Nursing Requirements Projections

Although the population is now growing at a somewhat reduced rate, by 1982 there will be 12.1 million more Americans than in 1976, an increase of approximately 6 percent. Persons over age 64 will make up approximately 11.3 percent of the population, and persons under age 17 will constitute 26.4 percent of the total. Special health care needs will be directed to these and other population groupings. Better informed consumers will demand additional nursing health care services. Voluntary enrollment in prepaid health insurance plans, in addition to Medicare and Medicaid benefits, will enable people to seek preventive care and health maintenance, as well as acute care. The growing complexity of health and nursing will increase demands for better prepared nursing personnel in a variety of clinical settings. Additionally, large numbers of nurses prepared for administrative, supervisory, teaching, research, consultation, and inservice education positions will be needed to provide leadership.

Taking all of the above factors into consideration, the resulting national requirements for 1982 based on the Panel's assumptions, estimates, and criteria for each of the key variables and decision points in the State Model are detailed in this section.

Total Numbers of Nursing Personnel

A summary of the Panel's 1982 range of requirements projections for all nursing personnel is included in Table VI.4. By 1982, the Panel projected the nation will need 1,219,300 to 1,677,000 FTE registered nurses. The Panel's lower bound projections for registered nurses by 1982 increased the 1976 number of 821,500 FTE RNs by 48 percent; the Panel's upper bound projections increased the number of registered nurses by 104 percent. The Panel's 1982 registered nurse projections provided for a range of 542 to 746 FTE RNs per 100,000 population which is an increase over the 1970 figure of 306 FTE RNs and the 1976 figure of 384 FTE RNs per 100,000 population. Data on FTE RNs per 100,000 population for the intervening years (1970-1976) are provided in Table VI.5.

The Panel projected requirements of 405,700 to 594,500 FTE LPNs, or a change of -6 to +38 percent from the 1976 FTE LPN levels. The Panel projected a *decrease* of 33 to 51 percent in the requirements for nursing aides from the 1976 levels. In its overall projection of the total complement of nursing personnel for 1982, the Panel projected a change of -5 to +33 percent from the number of FTE nursing personnel employed in 1976.

The above projections for registered nurses, licensed practical nurses, and aides reflect the Panel's belief that both quality and cost-effective nursing services are provided when the registered nurse staffing is increased and there is a decrease in the use of lesser prepared personnel.

Table VI.4

FTE Nursing Personnel, 1976, and Projected Requirements, 1982

1976 FTE Personnel[1]		1982 Projected FTE Personnel[2]			Percent Change, 1976-1982		
RNs							
Graduate[3]	30,400	203,200	to	317,700	+568	to	+945
Baccalaureate	142,500	580,900	to	794,700	+308	to	+458
A.D. & Diploma	648,600	435,200	to	564,600	-33	to	-13
Total	821,500	1,219,300	to	1,677,000	+48	to	+104
LPNs	429,600	405,700	to	594,500	-6	to	+38
Aides	936,800	466,600	to	629,000	-51	to	-33
Total	2,187,900	2,091,600	to	2,900,500[4]	-5	to	+33

[1] From the Interagency Conference on Nursing Statistics, and the Division of Nursing.

[2] See Appendix B.

[3] Includes master's and doctoral levels.

[4] All figures are subject to roundoff.

Table VI.5
Total FTE RNs, 1970-1976, and Projected Requirements, 1982

	FTE RNs	FTE RNs/100,000 Population
1970[1]	620,500	306
1971	642,000	313
1972	664,000	320
1973	696,500	333
1974	732,500	348
1975[2]	774,500	365
1976	821,500	384
1982[3]	1,219,300 to 1,677,000	542 to 746

[1] Data for 1970-1974 are from U.S. Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, *Source Book of Nursing Personnel* (DHEW Publication No. (HRA) 75-43) (Washington, D.C.: Government Printing Office, December 1974 and Division of Nursing).

[2] Data for 1975-1976 are from a Division of Nursing communication.

[3] See Appendix B.

Fields of Employment and Settings

Substantial increases were projected by the Panel for numbers of registered nurses required to provide therapeutic and quality care in nursing homes and in community health. Increases were projected for registered nurses in school and work places, hospitals, schools of nursing, and health-related organizations. For licensed practical nurses, the projections call for marked increases in the numbers of LPNs for nursing homes and decreases in the numbers of LPNs for hospitals and physicians' offices. The data on requirements projections by field of employment for the U.S. as a whole for registered nurses is provided in Table VI.6. and for licensed practical nurses in Table VI.7.*

Hospitals and Other Hospital Services

In 1972, there were 440,600 FTE registered nurses employed in hospitals. For 1973, the American Hospital Association reported some 31.8 million admissions and 248 million days of care for 5,891 nonfederal short-term general hospitals alone. The Master Facilities Inventory reported that in 1973 nearly 67 million visits were made to emergency rooms and more than 169 million visits were made to hospital outpatient departments. To meet the nation's needs in 1982 for these types of services, considering population growth and changes in care, the Panel projected a range of 810,900 to 1,044,400 FTE RNs (or an increase of 84 to 137 percent over those employed in hospitals in 1972). In 1974, there were 237,000 FTE LPNs employed in hospitals. The number of LPNs projected for 1982 ranges from 173,300 to 205,400 FTE LPNs, which is a *decrease* of 27 to 13 percent in the number of LPNs employed in hospitals from 1974. The Panel projected a range of 236,700 to 236,400 aides required by hospitals for 1982.

Nursing Homes

In examining the Panel's projections, it is obvious that dramatic increases in the numbers of registered nurses are projected for nursing homes. In 1972, 43,000 FTE RNs were employed in nursing homes. The Panel projected a lower range of 118,000 FTE RNs, or 174 percent more RNs than were employed in nursing homes in 1972. The Panel's upper range projections in this area proposed 243,300 FTE RNs for an increase of 466 percent over 1972 figures. In the past, registered nurses have played a relatively small role in nursing home and long-term care. However, the Panel projected marked increases in RNs for upgrading the care currently existing in many nursing homes from custodial care to care that provides maximum therapy and restoration for residents, thus improving quality in the nation's 11,062 nursing homes with their 926,000 beds.

In addition to the number of registered nurses, the Panel likewise projected an increase for licensed practical nurses in nursing homes to provide adequate nursing care. For 1982, a range of 210,700 to 370,200 FTE LPNs was projected, an increase of 248 to 513 percent from the numbers of LPNs employed in 1974. The Panel projected a range of 220,500 to 380,000 aides needed for nursing homes in 1982.

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*Since insufficient data are available on fields of employment for aides, no comparison can be made.

Community Health, School Health, Occupational Health

An increase is also observed in the Panel's projected requirements for community health, school, and occupational health. The Panel's lower range projections for community health totaled 99,800 FTE registered nurses, or a 170 percent increase from the 1972 figures of 36,900. The upper projections totaled 150,900, an increase of 309 percent. The Panel projected a range of 32,000 to 64,100 school health nurses, or 18 to 136 percent more than the 1972 registered nurses employment figures. For occupational health, the Panel projected the requirement for 36,500 RNs. This is a 99 percent increase in the numbers of registered nurses for occupational or industrial health nursing over the 1972 number.

Table VI.6
FTE RNs by Field of Employment, 1972,[1]
and Projected Requirements, 1982

1972 FTE[2]		1982 FTE RN Requirements[3]			Percent Change, 1972-1982		
Hospitals	440,600	810,900	to	1,044,400	+84	to	+137
Nursing Homes	43,000	118,000	to	243,300	+174	to	+466
Community Health	36,900	99,800	to	150,900	+170	to	+309
School Health	27,200	32,000	to	64,100	+18	to	+136
Occupational Health	18,300	36,500	to	36,500	+99	to	+99
Physicians' Offices	43,900	51,600	to	56,700	+18	to	+29
Nursing Education	27,500	39,000	to	49,700	+42	to	+81
Private Duty	27,500	22,500	to	20,200	-18	to	-27
Other	3,600	9,000	to	11,200	+150	to	+211
Total	668,500[4]	1,219,300	to	1,677,000[5]	+82	to	+151

[1] The figures for 1972 are the latest data avilable for FTE RNs by field of employment.

[2] From Aleda Roth and Alice Walden. *The Nation's Nurses: 1972 Inventory of Registered Nurses* (Kansas City, Mo.: American Nurses' Association, 1974). Adjusted for FTE.

[3] See Appendix B.

[4] The total 1972 FTE RN figure in Table VI.6 is different from the total figure in Table VI.5 because the data are derived from sources that used different estimation techniques.

[5] All figures are subject to roundoff.

Table VI.7
FTE LPNs by Field of Employment, 1974, and Projected Requirements, 1982

1974 FTE LPNs[1]		1982 FTE LPN Requirements[2]			Percent Change, 1974-1982		
Hospitals	237,000	173,300	to	205,400	-27	to	-13
Nursing Homes	60,400	210,700	to	370,200	+248	to	+513
Community Health	5,900	6,200	to	7,500	+5	to	+27
Occupational Health	2,400	0	to	0		-	
Physicians' Offices	24,100	15,500	to	11,300	-36	to	-53
Private Duty	22,200	0	to	0		-	
Other	10,500	0	to	0		-	
Total	362,500	405,700	to	594,500[3]	+12	to	+64

[1] From Aleda Roth and Gordon Schmittlings, *LPNs 1974 Inventory of Licensed Practical Nurses* (Kansas City, Mo.: American Nurses' Association, 1977). Adjusted for FTE.

[2] See Appendix B, lower bound of range corresponds to lower RN staffing levels, regardless of LPN staffing levels.

[3] All figures are subject to roundoff.

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In 1974, there were 5,900 FTE LPNs in community health. For 1982, the Panel projected the requirements for 6,200 to 7,500 LPNs for home health care and clinics (an increase of 5 to 27 percent). As of 1974, 2,400 LPNs were employed in occupational health settings. For 1982, licensed practical nurses were not projected by the Panel for occupational health. In community health 9,400 aides were projected at the lower bound, and 12,600 aides were projected at the upper bound.

Physicians' Offices

There were 43,900 FTE RNs employed in physicians' offices in 1972; 24,100 LPNs were employed in 1974. For 1982, the Panel projected the requirement for 51,600 to 56,700 RNs for physicians' offices. The projections call for a small increase of 18 to 29 percent over the 1972 figures. A *decrease* of licensed pracical nurses in physicians' offices was projected—36 to 53 percent—bringing the requirement to 11,300 to 15,500 LPNs. Aides were not projected for this setting.

Nurse Practitioners

It is estimated that as of 1977, approximately 8,000 nurses have completed formal practitioner programs. The Panel proposed a range of 26,900 to 57,100 nurse practitioners required in hospital ambulatory care, physicians' offices, nursing homes, and community health services for 1982.

Clinical Specialists

In the 1972 ANA *Inventory*, clinical specialists were not identified as a separate category. For 1982, the Panel projected the need for 42,400 to 77,800 clinical specialists within the direct client care category.

Administrators

For 1982, the Panel projected a figure of 29,200 FTE executive/principal nurse administrators and a range of 124,500 to 166,400 FTE midlevel nurse administrators. The lower range closely approximates the number of RNs in administrative positions as of 1972; the upper range projects an increase of about 42,000.

Inservice Instructors, Researcher/Consultants

The 1972 ANA *Inventory* did not separately identify inservice institutions and researchers; therefore, comparisons are difficult to make. For 1982 the Panel projected a range of 17,200 to 34,500 FTE RNs for inservice education, and 9,700 to 39,800 FTE registered nurses for researchers/consultants.

Schools of Nursing

In 1972, there were 27,500 FTE registered nurses employed in schools of nursing. The Panel projected a range of 39,000 to 49,700 FTE RNs, an increase of 42 to 81 percent above 1972 levels. Within these projections, 91 to 93 percent of this number of RNs are designated for faculty positions and 9 to 7 percent administrators in schools of nursing.

Private Duty

The number of FTE private duty nurses has been decreasing over the years. The Panel believes that as the staffing improves in agencies, the need for private duty nurses will further decrease. The Panel projected a range of 20,200 to 22,500 private duty nurses, a *decrease* of 27 to 18 percent from the 1972 figure of 27,500. In 1974, there were 22,200 licensed practical nurses in private duty nursing. The Panel made no projections for licensed practical nurses in the private duty area, believing that they should always work under direct supervision of a registered nurse or physician.

Health-Related Organizations

It was the belief of the Panel that, with the advent of health service agencies and other kinds of health care delivery units, there will be more nurses in health-related organizations. Thus, the Panel projected an increase in the number to be employed in such settings, examples of which include professional associations, state health departments, state boards of nursing, state nurses' associations, regional planning groups, and the federal government. The Panel projected a range of 9,000 to 11,200 registered nurses in health-related organizations, or an increase of 150 to 211 percent over the 1972 figures of 3,600.

Educational Preparation of Nurses

The Panel's recommendations regarding educational preparation of nurses are similar in nature to those recommended by the Surgeon General's Consultant Group on Nursing in 1963. The Panel not only reinforced but expanded greatly the need for nurses with baccalaureate and graduate degree preparation for virtually every clinical setting, as well as in administrative, supervisory, research, consultation, and teaching positions in hospitals, community agencies, and schools of nursing.

The Panel believes that the requirements for nurses prepared at baccalaureate and higher degree levels reflect what is required to provide the quality of nursing services needed.

The Panel's projections for baccalaureate-prepared registered nurses showed an increase of 308 to 458 percent over 1976 figures. Percentage increases over 1976 figures for registered nurses with preparation at the graduate level were even more striking, showing a needed increase of 568 to 945 percent. Concomitantly, the Panel has recommended a *decrease* in the number of associate degree and diploma-prepared registered nurses by 13 to 33 percent from 1976 figures. Refer to Table VI.4.

In 1976, 79 percent of the registered nurses had the diploma or associate degree as their highest level of preparation, 17.3 percent had baccalaureate degrees, and 3.7 percent had master's or doctoral degrees. The requirements projections call for these percentages to be reapportioned as follows: 36 to 34 percent to have diploma or associate degree preparation, 48 to 47 percent to have baccalaureate preparation, and 17 to 19 percent to have master's or doctoral degrees.

State-by-State Nursing Requirements Projections

State-by-state projections* were made by applying national trends to such state-specific data as population, facilities, and occupancy rates by maintaining constant the criteria for staffing and for the educational population of registered nurses.

The resulting 1982 requirements for registered nurses by total and by educational preparation, for licensed practical nurses, for aides on a state-by-state basis are provided in Table VI.8, Part I (lower bound) and Part II (upper bound).

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*The sum of the state-by-state projections does not equal the national total because of rounding procedures. The 2.3 to 2.8 percentage difference is not statistically significant.

Table VI.2 (Continued)

Field of Employment	Criteria for Staffing		Criteria for RN Educational Preparation			
	Lower Bound	Upper Bound	Doct. (%)	Master's (%)	Bacc. (%)	AD/DIP (%)
School health	1 RN per 1500 students (grades 1-12)	1 RN per 750 students (grades 1-12)		10[1]	90	
Occupational health	1 RN per 500 employees	1 RN per 500 employees		10[1]	90	
Other				10[1]	90	
NURSE PRACTITIONERS						
Hospital ambulatory care	10% of hospital ambulatory care RNs	13% of hospital ambulatory	Currently certificate and/or master's preparation exist			
Physicians' offices	15% of RNs in physicians' offices	25% of RNs in physicians' offices	Currently certificate and/or master's preparation exist			
Community health	10% of RNs in public health	10% of RNs in public health	Currently certificate and/or master's preparation exist			
Nursing homes	40% of clinical specialists in nursing homes	50% of clinical specialists in nursing homes[2]	Projections made for 100% master's preparation			
	RNs Per 100 Patients	RNs Per 100 Patients				
CLINICAL SPECIALISTS						
Large teaching (more than 400 beds)	3.0	5.0	Educational preparation for all clinical specialists is at graduate level			
Small (less than 100 beds), and all long-term hospitals	2.0	4.0				
All other short-term hospitals	2.0	4.0	Projections made for 100% master's preparation			
Nursing care homes	0.5	1.0				
Personal care homes with nursing	0.2	0.3				
Hospital ambulatory care	1 per 20 DCC RNs	1 per 20 DCC RNs				
Community health nursing	1 per 20 DCC RNs	1 per 20 DCC RNs				
ADMINISTRATIVE POSITIONS[3]						
Executive/Principal Nurse Administrator[4]						
All hospitals	1 Director of nursing per institution		5	95		
Large teaching (more than 400 beds)	2-3 Assistants and/or associate directors per institution		5	95		
All other short-term hospitals	1-2 Assistants and/or associate directors per institution		5	95		
Nursing care homes	1 Director of nursing per institution		5	95		
Personal care homes with nursing	1 Director of nursing per institution		5	95		
Community health nursing	1 Director per agency		5	95		

Table VI.2 (Continued)

[1] The Panel proposed that 10% of community health nurses be prepared at the graduate level but did not specify the percentage breakout between master's and doctoral levels. The numerical projections made in this report are based on master's-level preparation only because of the nature of the projection method used.

[2] For the purpose of the projections, this was converted from 2.5 to 2.75% of direct client care in nursing homes.

[3] The same criteria hold for both lower and upper bound projections for RNs in administrative positions.

[4] For the purpose of the projections, this was modified to three administrators for each large, teaching, short-term hospital; two administrators for each "all other" short-term hospital; and one administrator for each of the remaiming institutions (and agencies).

[5] For the purpose of the projections, this was modified to two administrators for each 10 direct client care RNs in large, teaching, short-term hospitals; 1.6 administrators for each 10 direct client care RNs in "all other" short-term hospitals; and one administrator for each 10 direct client care RNs elsewhere.

[6] Because of the nature of the mapping of the existing data, the projections for school of nursing administrators were made on the following basis: three administrators for each baccalaureate program and one for each other program.

[7] As staffing approaches the upper bound, the need for private duty registered nurses will decrease.

Table VI.3
Conversion Chart for Staffing Ratios and Hours of Nursing Care per Day*

	FTE Staff per 100 Patients				RN/LPN/Aide Ratio	Hours per Patient per Day[1]		RN Hours Care (%)
	RNs	LPNs	Aides	Total		RNs	Total Hrs	
GENERAL UNITS								
REHABILITATION								
NEWBORN UNITS								
ALL UNITS IN HOSPITALS LESS THAN 100 BEDS								
Lower bound	49	12	12	73	10/2.4/2.4	2.4	3.6	67
Upper bound	56.5	12	12	80.5	10/2.1/2.1	2.8	4.0	70
CRITICAL CARE								
Lower bound	200	0	0	200	10/0/0	9.9	9.9	100
Upper bound	250	0	0	250	10/0/0	12.3	12.3	100
EXTENDED CARE								
Lower bound	20	20	20	60	10/10/10	1.0	3.0	33
Upper bound	30	20	20	70	10/6.7/6.7	1.5	3.5	43
LONG-TERM PSYCH. HOSPITALS								
Lower bound	13	10	30	53	10/7.7/23.1	0.6	2.6	23
Upper bound	22	10	30	62	10/4.5/13.6	1.1	3.1	35
PSYCHIATRIC UNITS IN ALL SHORT-TERM HOSPITALS								
Lower bound	49	0	24	73	10/0/4.8	2.4	3.6	67
Upper bound	56.5	0	24	80.5	10/0/4.2	2.8	4.0	70
NURSING HOMES								
Lower bound	9	23	23	54	10/25/25	0.4	2.7	15
Upper bound	20	40	40	100	10/20/20	1.0	4.9	20
PERSONAL CARE HOMES WITH NURSING								
Lower and upper bounds	5	10	20	35	10/20/40	0.2	1.7	12

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*Figures based on 1,800 working hours per year per one full-time employee.

[1] Figures are subject to roundoff.

Table VI.8

1982 State-by-State Projections for RNs, LPNs, and Aides

Part I, Lower Bound Criteria

--------STATE--------	TOTAL FTE RN	--------RN BY EDUCATION LEVEL-------- DOCT.	MAST.	BACC.	AD/DIP	TOTAL LPN	TOTAL AIDE
ALABAMA	19112	251	3055	9002	6804	6428	7378
ALASKA	1656	14	238	802	602	440	488
ARIZONA	11873	169	1826	5689	4189	3326	3590
ARKANSAS	11849	120	1895	5571	4263	4587	4865
CALIFORNIA	107907	1098	16144	51728	38937	39151	41956
COLORADO	14102	164	2229	6650	5059	5500	6004
CONNECTICUT	17896	220	2860	8561	6255	6897	7856
DELAWARE	3742	53	566	1783	1340	1032	1182
DIST OF COLUMBIA	6865	145	997	3182	2541	1715	2350
FLORIDA	47632	378	6346	23110	17798	15173	17395
GEORGIA	25883	263	4134	12262	9224	10327	11835
HAWAII	3801	31	536	1818	1416	1076	1137
IDAHO	3763	34	629	1759	1341	1374	1432
ILLINOIS	63587	689	9362	30937	22599	20129	22672
INDIANA	29175	384	4645	13902	10244	9425	11030
IOWA	16637	207	2906	7673	5851	6600	7380
KANSAS	13463	149	2242	6228	4844	5028	5731
KENTUCKY	16832	208	2798	7902	5924	4574	5251
LOUISIANA	19484	252	3176	9143	6913	6698	7411
MAINE	5784	61	1065	2624	2034	2247	2509
MARYLAND	22197	258	3263	10693	7983	7450	9002
MASSACHUSETTS	40502	546	6711	18869	14376	15505	17643
MICHIGAN	47947	511	7113	23364	16959	15499	17237
MINNESOTA	25526	316	4168	11918	9124	10868	12277
MISSISSIPPI	11600	133	1945	5444	4078	3695	4629
MISSOURI	28364	298	4351	13591	10124	9447	10631
MONTANA	4700	73	866	2104	1657	1500	1585
NEBRASKA	8933	110	1571	4099	3153	3845	4154
NEVADA	3577	43	515	1754	1265	854	951
NEW HAMPSHIRE	5649	64	903	2633	2049	1980	2281
NEW JERSEY	38058	360	5733	18278	13687	11931	14482
NEW MEXICO	4835	46	801	2291	1697	1471	1696
NEW YORK	113441	1594	17207	54311	40329	35003	44505
NORTH CAROLINA	27263	357	4158	13162	9586	6981	8401
NORTH DAKOTA	4070	70	758	1786	1456	1583	1796
OHIO	61247	637	9502	29428	21680	19359	22219
OKLAHOMA	14520	163	2491	6743	5123	6284	6924
OREGON	10624	114	1776	4928	3806	4485	5131
PENNSYLVANIA	68892	795	10264	33020	24813	22725	27187
RHODE ISLAND	5810	82	866	2741	2121	1832	2178
SOUTH CAROLINA	13423	142	2104	6500	4677	4026	5043
SOUTH DAKOTA	4446	73	907	1943	1523	1781	2093
TENNESSEE	23438	265	3679	11157	8337	6527	7842
TEXAS	66820	799	10723	31610	23688	23793	26521
UTAH	5227	90	888	2424	1825	1462	1591
VERMONT	2821	35	503	1284	999	994	1123
VIRGINIA	24442	255	3765	11699	8723	6736	8409
WASHINGTON	16866	269	2984	7765	5848	8410	8976
WEST VIRGINIA	10317	106	1579	4888	3744	2530	3180
WISCONSIN	27100	404	4603	12577	9516	12142	13509
WYOMING	1881	20	321	862	678	621	773

Table VI.8

1982 State-by-State Projections for RNs, LPNs, and Aides

Part II, Upper Bound Criteria

STATE	TOTAL FTE RN	RN BY EDUCATION LEVEL				TOTAL LPN	TOTAL AIDE
		DOCT.	MAST.	BACC.	AD/DIP		
ALABAMA	26480	523	4669	12426	8862	9479	10041
ALASKA	2307	37	389	1128	753	646	602
ARIZONA	16231	351	2784	7798	5298	4816	4660
ARKANSAS	16613	282	2892	7790	5649	7115	7200
CALIFORNIA	150492	2628	24472	72324	51068	59492	59266
COLORADO	19920	371	3405	9403	6741	8481	8609
CONNECTICUT	25070	482	4310	11917	8361	10458	11029
DELAWARE	5036	111	862	2370	1693	1427	1502
DIST OF COLUMBIA	9201	268	1526	4212	3195	2244	2655
FLORIDA	65229	1009	9831	31515	22874	22138	23176
GEORGIA	36975	632	6346	17510	12487	15962	16800
HAWAII	5154	82	828	2473	1771	1487	1458
IDAHO	5302	86	964	2483	1769	2114	2108
ILLINOIS	86440	1567	14148	41680	29045	29126	30490
INDIANA	39979	804	6990	18907	13278	13782	14940
IOWA	23325	439	4381	10719	7786	10038	10602
KANSAS	18757	335	3435	8637	6350	7510	7908
KENTUCKY	22809	437	4194	10678	7500	6521	6816
LOUISIANA	27263	537	4852	12826	9048	10095	10322
MAINE	8231	143	1619	3737	2732	3412	3562
MARYLAND	30855	594	5033	14830	10398	10793	11691
MASSACHUSETTS	56518	1149	10117	26126	19126	23326	24566
MICHIGAN	65721	1180	10806	31843	21892	22818	23401
MINNESOTA	36052	687	6329	16734	12302	16620	17752
MISSISSIPPI	16207	295	2997	7592	5323	5282	5971
MISSOURI	38945	683	6589	18544	13129	14055	14621
MONTANA	6441	142	1298	2874	2127	2217	2232
NEBRASKA	12780	241	2394	5862	4283	5986	6163
NEVADA	4776	94	782	2323	1577	1185	1203
NEW HAMPSHIRE	7839	141	1388	3626	2684	2898	3086
NEW JERSEY	52345	877	8716	25034	17718	16983	18836
NEW MEXICO	6724	113	1239	3215	2157	2118	2165
NEW YORK	154645	3317	26087	73508	51733	48158	54729
NORTH CAROLINA	36667	740	6272	17584	12071	9627	10360
NORTH DAKOTA	5709	130	1153	2503	1923	2363	2521
OHIO	83618	1469	14275	39824	28050	28347	30153
OKLAHOMA	20923	370	3826	9732	6995	9880	10233
OREGON	15158	270	2700	7062	5126	6840	7275
PENNSYLVANIA	94589	1770	15641	44965	32213	32648	35659
RHODE ISLAND	7961	170	1334	3726	2731	2609	2848
SOUTH CAROLINA	18570	331	3226	8960	6053	5720	6370
SOUTH DAKOTA	6326	139	1369	2766	2052	2693	2933
TENNESSEE	31654	581	5553	14940	10580	9076	9950
TEXAS	93439	1768	16323	44149	31199	36267	37594
UTAH	7189	170	1337	3359	2323	2165	2189
VERMONT	3947	74	764	1790	1319	1446	1524
VIRGINIA	33344	589	5718	15936	11101	9330	10368
WASHINGTON	24853	549	4516	11558	8230	13571	13751
WEST VIRGINIA	13822	239	2418	6500	4665	3291	3663
WISCONSIN	38617	824	6963	17869	12961	18606	19796
WYOMING	2631	46	504	1200	881	875	993

Chapter VI.5
Recommendations

In making its nursing requirements projections for 1982 both on state-by-state and national bases, the Panel is cognizant of the context of the health care scene in which nursing services are provided, nursing's role in the changing health care scene, and changes in nursing education and nursing practice.

Needs and Goals

The present problems in health care delivery and the requirements projections clearly point to the need for (1) more registered nurses to be prepared at baccalaureate and higher degree levels to ensure appropriate competencies for the provision of quality nursing services; (2) improved health care services for the elderly; and (3) increased emphasis on preventive care, including community health services.

The Panel's discussions and decisions, together with the resulting requirements projections, clearly identify the need to:

1. Strengthen the educational preparation of nurses in practice
2. Improve the distribution of nursing services and the delivery of health care
3. Improve the practice of nursing
4. Improve planning to provide adequate educational programs and a sufficient supply of nurses for health services.

To accomplish these, the Panel made specific recommendations in relation to each of the goals.

The Panel recognizes that, just as goals are mutual and endorsed by many groups, so must responsibility for achieving them be a shared endeavor. Thus, some of the recommendations set forth can be carried out by individuals, educational and service agencies, professional organizations, and/or local, state, and federal agencies. The nursing profession must collaborate with other health professions, community groups, colleges and universities, hospitals and community agencies, private and public sectors, consumers, and local, state, and federal agencies to meet nursing service requirements for the future.

Goal 1: Strengthen Educational Preparation

The Panel's projections identify the need for a substantial increase in the number of nurses prepared at baccalaureate, master's, and doctoral degree levels. The knowledge and competencies generated through professional programs will enable registered nurses to fulfill their responsibilities to improve the health status of the American people and to serve as primary, acute, and long-term care providers. More nurses prepared for administrative, faculty, and research positions are also needed to provide quality nursing services and education.

To achieve this goal, the Panel has made specific recommendations to increase the number of nurses for administrative and faculty positions, to increase the number of students in baccalaureate and higher degree programs, and to increase content and experience in these programs while preparing nurses to provide primary care, to care for the elderly, to serve in rural underserved areas, and to promote consumer health education.

Nurse Administrators

Nursing service administrators as a group constitute a national resource in the provision of quality nursing services. They are in key positions to provide an environment conducive to the improvement of the quality of nursing practice. Latest statistics from the American Society of Nursing Service Administrators indicate that only 15 percent of directors of nursing are adequately prepared educationally for their positions; indeed, 75 percent of all directors in nursing in this country have only diploma preparation as their highest level of education.* Therefore, the Panel recommends as the *first* priority that:

- The number of nurses academically prepared for nursing administrative positions in the health care delivery system be increased quickly and substantially.

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*Information reported at the Panel of Expert Consultants' meeting, Denver, Colorado, July 20-22, 1977.

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To meet this priority need, the Panel recommends that:

- Financial support be provided to expand and/or improve graduate schools offering programs in nursing service administration
- Support be given to programs providing innovative approaches to increase and/or update the competencies of persons currently in nursing service administrative positions
- Sabbatical leaves be provided so that nurses in administrative positions can pursue more intensive educational programs designed for them

Faculty

The panel recognizes the need for well-prepared faculty members to teach in all programs. The faculty plays a key role in providing the quality of education needed to prepare graduates with the necessary competencies for practice. Only 44 percent of faculty members in all schools of nursing are prepared at the master's or doctoral degree level. The educational preparation of faculties in associate degree and diploma programs appears to be the greatest problem.[42] To meet this immediate need, the Panel recommends that:

- Systematic approaches be developed to assist faculty currently in associate degree and diploma programs who are in need of additional preparation to pursue further graduate study. Examples of such approaches include provision of stipends and the development of ways to protect accrued employment benefits.

Programs

At present, there are a number of programs that prepare nurses at baccalaureate and higher degree levels. These programs could accommodate more students if appropriate resources were available. The Panel therefore recommends that:

- There be maximum utilization of established college and university programs of nursing education with a view to increasing enrollments in those undergraduate and graduate programs that use complex acute care institutions plus community-based and rural health care services for student learning
- Federal and state funds be provided to permit enlarging the number of faculty in such established college and university programs in nursing education to accommodate the increased enrollment
- There be maximum utilization of qualified faculties in relatively small baccalaureate and graduate programs. This can be accomplished through adequately funded and academically sound experimentation with extended campuses, consortia of institutions, interinstitution transfer of credit, joint sponsorship of academic programs, and other approaches that make optimal use of available human, academic and financial resources.

Students

Mobility: There are many individuals now licensed as registered nurses or as licensed practical nurses who could pursue advanced preparation and thus more rapidly increase the supply of nurses prepared at the baccalaureate level. The Panel therefore recommends that:

- Baccalaureate programs provide academically sound curricula that build on previous work in the nursing field
- Opportunities be increased and financial support be provided for able, career-oriented graduates of practical, associate degree, and diploma programs in nursing so they can pursue nursing education at the baccalaureate degree level.

Ethnic Minorities and Men: The Panel recognizes that the number of ethnic minorities and men recruited into nursing has been disproportionately low and many of these have entered practical nurse or associate degree programs. Further efforts to recruit and retain students of diverse cultural backgrounds are necessary to provide advanced educational opportunities for those groups that traditionally have been underrepresented and to improve the health care for all citizens.

The Panel believes that increased subsidies from public funds of educational programs must be contemplated when the American public overlays a social goal onto an educational goal. Increasing the representation of minority and disadvantaged groups in baccalaureate and higher degree programs inevitably adds to their cost. This additional cost must be paid to meet the goal of increasing the number of minorities in the health field.

To accomplish this goal, the Panel recommends that:

- Provision be made for general financial assistance to and tutelage of minority and disadvantaged students to encourage and increase their learning opportunities in baccalaureate and higher degree programs
- Federal and state funds be provided to those baccalaureate nursing programs that recruit, retain, and graduate ethnic minorities and men
- Culturally diverse content be included in all programs.

Potential Students: There are many who would pursue baccalaureate and higher degrees if there were a greater understanding of the nursing profession, greater access to programs, and programs that met individual needs.

The Panel therefore recommends that:

- A national program to inform potential candidates, parents, and counselors of the nature of modern professional nursing practice and of the educational preparation required.
- Educational programs be made compatible with the life styles of men and women who are heads of households and those who have diverse cultural backgrounds
- Greater numbers of college graduates be recruited into programs of professional study
- Financial support be provided for a small number of pre-service programs leading to a professional doctoral degree for college graduates.

Curriculum Content

The Panel recognizes the importance of curricula content and educational experiences relevant to society's needs. Examples include needs in primary, acute, and long-term care; needs of the elderly; and needs of those in rural and underserved geographic areas. The Panel therefore recommends that:

- Financial support be provided to selected baccalaureate programs that prepare nurses with demonstrated competencies in primary, acute, and long-term nursing care, and which offer opportunities for students to learn in remote, rural, and underserved geographic areas
- Curricula in both baccalaureate and graduate programs should provide content and practice to develop competencies in gerontology, an area of critical nursing lacking both in numbers and in preparation
- Schools of nursing in institutions of higher education should develop programs to prepare nurses to provide consumer health education, the ultimate aims of which are to promote health and prevent disease or the progression of disease.

To date, most nurse practitioners are prepared through certificate programs. On the basis of the belief that the certificate programs should be phased out within the next five years and that preparation should be through offerings in degree programs, the Panel therefore recommends that:

- All baccalaureate programs offer content to ensure that graduates have knowledge and skills in the areas of health histories and assessing the physical and emotional health status of their clients
- Graduate programs preparing clinical nursing specialists ensure that graduates have the preparation needed to function as practitioners in the management of patient care in specified settings.

Goal 2: Improve the Distribution of Nursing Services and the Delivery of Health Care

It is essential that health care services be provided to people living in areas that are currently underserved. As geographical availability of services is expanded, cost containment must be addressed concurrently. The Panel developed recommendations in several areas to begin addressing what is possibly the single most acute problem in health care delivery: distribution of nursing services.

Registered nurses can increase their significant contributions to the improvement of the health status of aged persons, of the disadvantaged, and of the young people, and to the restoration of those who have sustained impairments as a consequence of disease, injury, or deprivation. Immediate attention must be given to using competencies of registered nurses where cost containment may result through expansion of existing roles. Therefore, the Panel recommends that:

- Programs be strengthened and enlarged in community health settings to utilize the talents of registered nurses who are prepared as primary and long-term care providers to provide home health care and general public health nursing in the home, schools, occupational health settings, nursing homes, and extended care facilities
- Community health agencies, nursing homes, and extended care facilities strengthen and expand programs that use the talents of RNs who are competent as primary health and long-term care providers
- Reimbursement for these providers and services be established and implemented in all of the community health and long-term care settings
- Immediate attention be given to improving nursing care of the elderly, whether in their own homes or in nursing homes
- Appropriate and necessary referral and support services be established and implemented
- Resources be provided to support the demonstration of innovative methods to deliver health care services and to evaluate their effectiveness.

Large numbers of well-prepared registered nurses are needed to serve in rural, remote, and currently underserved institutions and geographic areas. To address this problem systematically, the Panel recommends that:

- Support be provided to schools of nursing

whose curricula include opportunities for students to have supervised clinical practice in such settings
- Sufficiently rewarding incentive programs be provided to attract prepared registered nurses to serve in such underserved institutions and communities
- Reimbursement categories (from third-party payers) be changed so that appropriate budgetary allocations can be included to support such nursing care services.

In community health nursing, service to clients who are at high risk and in need of health care must have high priority. Therefore, the Panel recommends that:

- Reimbursement mechanisms for home visiting in home health care and general public health nursing be instituted
- Reimbursement mechanisms be available to groups of nurses offering service in outpatient and ambulatory care settings or other settings where direct reimbursement for nursing services can provide quality care (to the consumer or to the service provider) in cost-effective ways.

The ability of home health care agencies to provide adequate nursing services to persons who must be seen soon upon referral from hospitals or nursing homes is jeopardized by the long delays currently encountered in the reimbursement for those nursing services. Therefore, the Panel recommends that:

- Innovative approaches be developed to assist home health care agencies with funding to allow continued and expanded provision of such nursing services. The Panel proposes, as an example, a low-interest borrowing mechanism, patterned after the International Monetary Fund.

Primary, acute, and long-term nursing care of patients requires nursing leadership from those who are prepared at baccalaureate and higher degree levels. Therefore, the Panel recommends that:

- Incentives in nursing service settings include appropriate rewards for investments made by registered nurses in pursuing baccalaureate and higher degree education, as well as in continuing education.

Goal 3: Improve the Practice of Nursing

Expectations placed on registered nurses are changing substantially. Better prepared nursing personnel and research-based practice are necessary for nursing to address appropriately and adequately the growing complexity of health care and nursing services, in addition to a more informed and educated public consumer demanding a higher quality of care. The staffing criteria developed by the Panel reflect the needs for both increased preparation and increased numbers of registered nurses.

Collaboration Between Nursing Education and Nursing Service

Since the ultimate goal of service and education is the improvement of health care, it is imperative that faculty schools of nursing and nursing staff in health care agencies work together to improve care of clients and education of students and staff. The Panel therefore recommends that:

- Nursing education and nursing service plan together ways to improve care and education.
- Joint appointments be formally established which specify relationships, functions and reimbursements.

Continuing Education

Because of the rapid changes in health care in recent years, many nurses currently in practice did not have in their formal education programs certain content now necessary for safe and therapeutic practice. Therefore, continuing education is needed to provide such content to supplement the educational preparation of registered nurses. In addition, all nurses need regular and systematic updating on current practice. Continuing education can also increase knowledge for those nurses who, for various reasons, are unable to pursue formal education programs leading to baccalaureate and higher degrees. Some states are now requiring continuing education for relicensure. The Panel therefore recommends that:

- Institutions and agencies providing health care services develop plans that encourage or require nursing staff to undertake continuing education in order to acquire the content and skills necessary to provide quality health care to the consumer
- Continuing education programming offered by schools of nursing be expanded. These nursing education programs should focus on the competencies required to improve and update the practice of the current nurse population. Immediate attention is needed in community health and geriatrics.

Research

Research findings have contributed significantly toward advancing nursing knowledge and technology and improving nursing practice. Research demonstrates that improved health results from increased use of professional nurses. Opportunities for well-qualified registered nurses to obtain or enhance their research skills should be provided. Therefore, the Panel recommends that:

- Federal and state support be provided for nursing research centers
- Federal and state support be provided for nursing research projects in education and in nursing practice settings, including research on staffing patterns
- Federal and state support be provided for studies relative to demonstration of innovations in nursing practice, education, and administration, including those that focus on seeking new areas where professional nurse activities may improve health outcomes and/or affect cost containment
- Funding be provided for predoctoral nursing students in preparation for the conduct of independent or collaborative research in fields having significance for nursing theory and practice
- Support be provided for fellowships for registered nurses undertaking postdoctoral study.

Goal 4: Improve Planning

Nursing personnel is the largest single category of health manpower and is essential to health care delivery. Nursing is a major national health resource. A mechanism is needed at the federal level through which nursing can work collaboratively in health planning with other health disciplines to improve the quality of care. Federal concerns in nursing education, nursing practice, nursing manpower, and nursing research must interrelate so that health care needs nationally can be addressed more effectively than in the past. Therefore, the Panel recommends that:

- A strong focal point for nursing at the federal level, namely, the Division of Nursing, be continued and strengthened as expanded nursing activities, including research, play increasingly significant roles in health care delivery.

An extensive, current, and comprehensive data base is needed for health planning. Although the data base assembled for the Analysis and Planning project is the most extensive in the nation, there are deficiencies in the data. The Panel therefore recommends that:

- National resources be sought to ensure the continuing collection of data at national and state levels to develop a sound and significant data base for ongoing projections for nursing resources and requirements.

Changes in the needed preparation of nurses will result in changing the sites of their educational preparation. Those programs that cannot produce nurses having the required kinds and scope of preparation must reexamine their roles in nursing education. Changes must be carefully planned. Thus, the Panel recommends that:

- State boards of nursing, health systems agencies, and regional planning agencies, utilizing state and regional data on requirements and resources and specified criteria, plan for the establishment of new programs; the expansion, phasing down, or merger of existing programs; and the phasing out of programs not needed or not meeting the criteria.

Sound methodologies to project nursing requirements and resources are essential. The Panel recognizes that the State Model is a significant guide for making projections at state and substate levels, as well as making projections nationally. The Panel encourages individual states to carry out their own studies and recommends that:

- State nurses' associations take responsibility to coordinate and implement state planning for nursing
- The composition of state and local advisory groups be representative of an appropriate mix of nursing, health-related, and other relevant disciplines.

General Recommendation

The recommendations discussed above are aimed at improving the quality and quantity of nursing care. Implementation of some of these recommendations will require considerable expenditures of money. Realizing that cost containment is an important consideration, Panel members strongly believe that measures to control health costs should allow for the changes necessary to improve the health care delivery system. Therefore, the Panel makes the general recommendation that:

- Measures to contain costs include provisions for the increased education and employment of nursing personnel as projected in this report.

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The nursing profession should assume responsibility for forwarding these recommendations to appropriate individuals, groups, and agencies. It is urgent that the decisions and recommendations contained herein be weighed by those involved in the planning and delivery of health care. This report and its recommendations provide a basis for necessary next steps to improve the health care of the citizens of this country.

FOOTNOTES

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GLOSSARY

The following are definitions of terms used in the accompanying report, *Panel of Expert Consultants: Final Report.*

Administrative Position

Includes those positions that primarily entail executive, administrative, or managerial responsibility for a nursing agency or system of agencies, or a recognized department or subdivision thereof.

Ambulatory Care

Refers to care rendered to a person who walks into a place for care and walks out after the needed care has been obtained.

Clinic Visiting

See definition listed under Community Health Nursing.

Clinical Nurse Specialist

Refers to a registered nurse who is prepared at the graduate level and who is prepared to function as an expert in a clinical nursing specialty.

Community Health Nursing

Refers to the application of prevention, health promotion, and maintenance services to populations of individuals and groups within their own environments of home, school, clinic, or work place in the community, and the application of public health measures to the community as a whole, such as epidemiology, investigation, law enforcement, or organizing of communities for health action.

1. Home Visiting
    a. Home Health Care

        Refers to that component of community health nursing (CHN) providing skilled nursing care to patients who are homebound or to ambulatory individuals who can be most appropriately served in their place of residence.

    b. General Public Health

        Refers to case finding within the community to identify and pursue individuals and groups at high risk or preventive morbidity and premature mortality for evaluation and follow-up, and home visiting to assist families to identify and solve those problems that affect their health and well-being.

2. Clinic Visiting

    Refers to health assessment and maintenance to ambulatory individuals with acute conditions, exacerbations of chronic conditions, or subacute/stabilized chronic conditions.

3. School Health Nursing

    Refers to that component of community health nursing that focuses on health and the health potential of school-age populations with emphasis on health education, guidance, and counseling, and providing linkages between teachers, parents, and other health providers who interpret the health needs of school children.

4. Occupational Health Nursing

    Refers to that branch of community health nursing that focuses on the health of the worker, and which includes the promotion of safety and health and care for illness and injuries occurring in the work place.

5. Regulation and Licensure Program

    Refers to that component of community health nursing, the primary functions of which are the monitoring of quality control and promotion of quality assurance of nursing in institutional care facilities, and whose primary responsibility is the investigation, regulation, licensing, and consultation in such institutions or facilities as hospitals, nursing homes, day care centers, and clinics.

Consultant Position

Includes those positions in which the primary responsibility is an advisory one. Related areas in nursing in which consultation is provided include client care, administration, instruction, and research.

Continuing Education

Refers to credit or noncredit offerings provided by a nursing organization, university, hospital, or health department to increase the knowledge and competencies of individuals.

Critical Care Unit

Refers to a special unit in which patients are concentrated, by reason of serious illness, without regard to diagnosis (ICU, intensive care unit) and/or a special unit staffed and equipped solely for intensive care of cardiac patients (CCU, coronary care). Special life-saving techniques and equipment are available at all times, and patients are under continuous observation by nursing staff especially trained and selected for care of this type of patient. Critical care units also include those caring for high-risk infants.

Demand for Nurses

Refers to the number of nurses that consumers will employ at various rates of compensation.

Direct Client Care Position

Includes all those nursing positions in which the nurse's primary role is the provision of direct nursing care to patients.

Educator Position

Includes those positions in which the primary role responsibility is the teaching of nursing, either in a formal educational nursing or multidisciplinary program or in an inservice program in a health care institution.

Emergency Visit

Refers to visits to organized facilities of a hospital for the provision of emergency outpatient services for conditions requiring immediate care.

Executive Nurse Administrator

Denotes a top-level position in which the individual is the nursing executive or administrator of an independent association, agency, unit, or corporation within the nursing system.

Extended Care Unit

Refers to a unit that provides physician services and continuous professional nursing supervision for patients who are not in an acute phase of illness and who currently require primarily convalescent, restorative, or long-term skilled nursing care.

General Medical-Surgical Unit

Refers to a section, ward, wing, or floor that provides physician services and continuous professional nursing supervision for patients who are in an acute phase of illness and who currently require diagnostic, medical and/or surgical interventions, and limited restorative care. For this report, adult medical-surgical, pediatrics, and maternity are included in this category.

General Public Health Nursing

See definition listed under Community Health Nursing.

Health-Related Organizations

Refers to such organizations as professional associations, regional planning groups, state boards of nursing, and health agencies that are involved with health concerns and issues.

Home Health Care

See definition under Community Health Nursing.

Inpatient Services

Includes those services designed to provide direct patient care (including prevention, diagnosis and treatment, rehabilitation) to persons who are residing at least overnight on the premises of the care setting.

Long-term Hospital

Refers to an inpatient facility where the average stay of most patients is longer than 30 days.

Mid-level Nurse Administrator

Denotes a position in which the nurse administrator has authority and responsibility for a single unit, which is higher than the lowest level for which management is required or for multiple units at the lowest management level.

Newborn Unit

Refers to the unit caring for normal newborn infants in nurseries.

Nurse Practitioner

Refers to a registered nurse who has successfully completed a formal program of study designed to prepare RNs to provide primary health care through diagnosis, clinical judgment, and management abilities to restore, maintain, and improve the health status of clients.

Nursing Care Home

Refers to a facility in which 50 percent or more of the residents receive nursing care and in which a registered nurse or licensed practical nurse is employed at least 35 hours per week.

Nursing Manager/Coordinator

Denotes a position in which the nurse's primary responsibility can be described as initial level of administration.

Occupational Health Nursing

See definition listed under Community Health Nursing.

Outpatient Clinic Visits

Refers to ambulatory visits to a clinic or dispensary connected with it for diagnosis and treatment; includes units that provide renal dialysis; rehabilitation; and psychiatric, abortion, or other organized outpatient services.

Personal Care Home With Nursing

Refers to a facility in which: (1) some but less than 50 percent of the residents receive nursing care and in which there is at least one full-time RN or LPN; or (2) some of the residents receive nursing care, non-RNs or LPNs are employed, and the institution either provides administration of medicines or provides assistance with three or more activities of daily living.

Physician's Assistant

Refers to a person who has had a formal program of study designed to prepare that individual to assist the physician under his direct supervision in providing medical care and treatment.

Physicians' Office Visit

Refers to a visit to a private practice, partnership, or corporation set up by an individual physician or group of physicians, in which a nurse functions either in a supportive or collegial role.

Primary Health Care

Care that may be initiated by the client or provider in a variety of settings and consists of a broad range of personal health care services.

Primary Nursing Care Assignment

Refers to a method of assignment by which a primary nurse provides total care to a patient while he/she is on duty and plans the patient's 24-hour care throughout the patient's hospitalization.

Principal Nurse Administrator

Denotes a position in which the nurse administrator has authority and concomitant responsibility for single or multiple units within an institution and in which he/she is accountable directly to a higher administrative level that reports to the governing board.

Psychiatric Unit

Refers to a specific section, ward, wing, or floor designed primarily for the care of psychiatric inpatients.

Regulation and Licensure Programs

See definition listed under Community Health Nursing.

Rehabilitation Unit

Refers to a unit that provides coordinated multidisciplinary physical restorative services.

Requirements for Nurses

Refers to the number of nurses judged to be necessary to provide high-quality care.

Researcher Position

Includes those positions in which the primary role responsibility is to direct and/or engage in nursing research.

Resources

Refers to the number of nursing personnel expected to be actually available.

School Health Nursing

See definition listed under Community Health Nursing.

Self-care Unit

Refers to a unit designed for ambulatory patients who need minimal nursing care but who must remain hospitalized.

Short-term Hospital

Refers to an inpatient facility where the patient's stay is relatively short (about 8 days in nonfederal hospitals or approximately 18 days in federal hospitals).

Supply of Nurses

Refers to the number of nurses who are employed either on a full- or part-time basis.

Appendix A
Public Law 94-63, Title IX,
Section 951 of Part D

Appendix A
Public Law 94-63, Title IX

Part D—Miscellaneous

INFORMATION RESPECTING THE SUPPLY AND DISTRIBUTION OF AND REQUIREMENTS FOR NURSES

Sec. 951. (a)(1) Using procedures developed in accordance with paragraph (3), the Secretary of Health, Education, and Welfare (hereinafter in this section referred to as the "Secretary") shall determine on a continuing basis—

(A) the supply (both current and projected and within the United States and within each State) of registered nurses, licensed practical and vocational nurses, nurse's aides, registered nurses with advanced training or graduate degrees, and nurse practitioners;

(B) the distribution, within the United States and within each State, of such nurses so as to determine (i) those areas of the United States which are oversupplied or undersupplied, or which have an adequate supply of such nurses in relation to the population of the area, and (ii) the demand for the services which such nurses provide; and

(C) the current and future requirements for such nurses, nationally and within each State.

(2) The Secretary shall survey and gather data, on a continuing basis, on—

(A) the number and distribution of nurses, by type of employment and location of practice;

(B) the number of nurses who are practicing full time and those who are employed part time, within the United States and within each State;

(C) the average rates of compensation for nurses, by type of practice and location of practice;

(D) the activity status of the total number of registered nurses within the United States and within each State:

(E) the number of nurses with advanced training or graduate degrees in nursing, by specialty, including nurse practitioners, nurse clinicians, nurse researchers, nurse educators, and nurse supervisors and administrators; and

(F) the number of registered nurses entering the United States annually from other nations, by country of nurse training and by immigrant status.

(3) Within six months of the date of the enactment of this Act, the Secretary shall develop procedures for determining (on both a current and projected basis) the supply and distribution of and requirements for nurses within the United States and within each State.

(b) Not later than February 1, 1977, and February 1 of each succeeding year, the Secretary shall report to the Congress—

(1) his determinations under subsection (a)(1) and the data gathered under subsection (a)(2):

(2) an analysis of such determination and data; and

(3) recommendations for such legislation as the Secretary determines, based on such determinations and data, will achieve

(A) an equitable distribution of nurses within the United States and within each State, and (B) adequate supplies of nurses within the United States and within each State.

(c) The Office of Management and Budget may review the Secretary's report under subsection (b) before its submission to the Congress, but the Office may not revise the report or delay its submission, and it may submit to the Congress its comments (and those of other departments or agencies of the Government) respecting such report.

Appendix B

Panel of Expert Consultants' Projected Requirements of Nursing Personnel, 1982

Part 1 - Lower Bound Criteria
Part 2 - Upper Bound Criteria

APPENDIX B
PART 1

UNITED STATES OF AMERICA

REQUIREMENTS

ANALYSIS AND PLANNING
FOR IMPROVED DISTRIBUTION
OF NURSING PERSONNEL AND SERVICES

PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATE - POPULATION

	1974	1982		1974	1982
*COUNT BY AGE			*INFANTS		
UNDER 17 YEARS(2)	63117000	59351000	LIVE BIRTHS(5)	3160000	3985800
AGE 17 - 64 YEARS(3)	124577000	140139000	DEATHS 1 MONTH TO 1 YEAR OF AGE(6)	52300	66000
OVER 64 YEARS(4)	21824000	25295000			
*TOTAL	209518000	224785000			

***ESTIMATES DIRECT	1975	1982							
CLIENT CARE NURSING PERSONNEL	BEDS/10K POPULATION	BEDS/10K POPULATION	OCCUP. RATE	AVE.DAILY CENSUS	RN/100 PATIENTS	TOTAL FTE RN	RN/LPN/AIDE RATIO	TOTAL LPN	TOTAL AIDE
**INPATIENT SERVICES									
*LONG TERM HOSPITALS									
*PSYCHIATRIC(7)	11.99	11.99	84.32	227256	13.00	29543	10/ 7.7/23.1	22748	68244
*ALL OTHER LONG TERM									
GENERAL UNIT(8)[1]	5.92	5.92	83.59	111235	49.00	54505	10/ 2.4/ 2.4	13081	13081
CRITICAL CARE UNIT(9)	0.04	0.04	83.59	751	200.00	1502	10/ 0.0/ 0.0	0	0
SELF CARE UNIT(10)	0.11	0.00	83.59	0	0.00	0	10/ 0.0/ 0.0	0	0
EXTENDED CARE UNIT(11)	0.57	0.57	83.59	10710	20.00	2142	10/10.0/10.0	2142	2142
REHABILITATION UNIT(12)	0.13	0.13	83.59	2442	49.00	1196	10/ 2.4/ 2.4	287	287
PSYCHIATRIC UNIT(13)	0.29	0.29	83.59	5449	13.00	708	10/ 7.7/23.1	545	1635
*SHORT TERM HOSPITALS									
*SMALL UNDER 100 BEDS(14)	8.29	8.29	61.42	114464	49.00	56082	10/ 2.4/ 2.4	13459	13459
*LARGE,OVER 400 BEDS,TEACHING									
NEWBORN UNIT(15)	0.95	0.94	80.75	17062	49.00	8360	10/ 2.4/ 2.4	2006	2006
GENERAL UNIT(16)	15.49	15.49	80.75	281165	49.00	137770	10/ 2.4/ 2.4	33064	33064
CRITICAL CARE UNIT(17)	0.69	0.69	80.75	12524	200.00	25048	10/ 0.0/ 0.0	0	0
SELF CARE UNIT(18)	0.11	0.00	80.75	0	0.00	0	10/ 0.0/ 0.0	0	0
EXTENDED CARE UNIT(19)	0.57	0.57	80.75	10346	20.00	2069	10/10.0/10.0	2069	2069
REHABILITATION UNIT(20)	0.26	0.26	80.75	4719	49.00	2312	10/ 2.4/ 2.4	554	554
PSYCHIATRIC UNIT(21)	1.21	1.21	80.75	21963	49.00	10761	10/ 0.0/ 4.8	0	5165
*ALL OTHER SHORT TERM									
NEWBORN UNIT(22)	2.16	2.16	75.12	36473	49.00	17871	10/ 2.4/ 2.4	4289	4289
GENERAL UNIT(23)	22.68	22.68	75.12	382971	49.00	187655	10/ 2.4/ 2.4	45037	45037
CRITICAL CARE UNIT(24)	1.29	1.29	75.12	21782	200.00	43564	10/ 0.0/ 0.0	0	0
SELF CARE UNIT(25)	0.14	0.00	75.12	0	0.00	0	10/ 0.0/ 0.0	0	0
EXTENDED CARE UNIT(26)	1.00	1.00	75.12	16885	20.00	3377	10/10.0/10.0	3377	3377
REHABILITATION UNIT(27)	0.20	0.19	75.12	3208	49.00	1571	10/ 2.4/ 2.4	377	377
PSYCHIATRIC UNIT(28)	0.82	0.82	75.12	13846	49.00	6784	10/ 0.0/ 4.8	0	3256
**TOTAL HOSPITAL INPATIENT----------------------				1295241		592820		143035	198042

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[1] General units include adult med-surg/maternity/pediatrics

APPENDIX B
PART 1

UNITED STATES OF AMERICA

ANALYSIS AND PLANNING FOR IMPROVED DISTRIBUTION OF NURSING PERSONNEL AND SERVICES

REQUIREMENTS

PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATES CONTINUED DIRECT CLIENT CARE	1975 SERVICES/10K POPULATION	1982 SERVICES/10K POPULATION	1982 TOTAL SERVICES	1982 RN/1000 SERVICES	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**OTHER HOSPITAL SERVICES								
SURGICAL OPERATIONS(29)	825.23	825.23	18549932	1.50	27824	10/ 0.0/ 3.0	0	8347
EMERGENCY VISITS(30)	3479.79	3730.81	83863012	0.22	18449	10/10.0/10.0	18449	18449
OUTPATIENT CLINIC VISITS(31)	4462.54	4784.44	107547034	0.11	11830	10/10.0/10.0	11830	11830
**TOTAL HOSPITAL-BASED DIRECT CLIENT CARE----------------------------					650973		173314	236668

	1973 BEDS/10K POP.OVER 64	1982 BEDS/10K POP.OVER 64	1982 OCCUP. RATE	1982 AVE.DAILY RESIDENTS	1982 RN/100 RESDNTS	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**NURSING HOMES									
*NURSING CARE HOMES(32)	379.06	382.48	92.30	892986	9.00	80368	10/25.0/25.0	200920	200920
*PERSONAL CARE HOMES W/NSG(33)	45.41	46.23	83.78	97971	5.00	4898	10/20.0/40.0	9796	19592
**TOTAL NURSING HOME-BASED DIRECT CLIENT CARE----------------------------				990957		85266		210716	220512

	1973 NO.OF MDS	1982 NO.OF MDS	1982 RN/10 MDS	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**PHYSICIANS OFFICES(34)	197600	257900	2.00	51580	10/ 3.0/ 0.0	15474	0

**COMMUNITY HEALTH	POPULATION BASE	1982 POPULATION	1982 RN/10K POP.	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
HOME HEALTH CARE(35)	TOTAL POPULATION	224785000	0.65	14611	10/ 2.0/ 2.5	2922	3652
	OVER 64 YEARS	25295000	2.29	5792	10/ 2.0/ 2.5	1158	1448
GENERAL PUBLIC HEALTH(36)	LIVE BIRTHS	3985800	4.52	1801	10/ 0.0/ 0.0	0	0
	INFANT DEATHS	66000	23.90	157	10/ 0.0/ 0.0	0	0
	UNDER 17 YEARS	59351000	1.29	7656	10/ 0.0/ 0.0	0	0
	17 YEARS AND OVER	165434000	1.29	21340	10/ 0.0/ 0.0	0	0
CLINIC(37)	TOTAL POPULATION	224785000	0.95	21354	10/ 1.0/ 2.0	2135	4270
SCHOOL HEALTH(38)	UNDER 17 YEARS	59351000	5.14	30506	10/ 0.0/ 0.0	0	0
OCCUPATIONAL HEALTH(39)	AGE 17-64 YEARS	140139000	2.48	34754	10/ 0.0/ 0.0	0	0
OTHER(40)	TOTAL POPULATION	224785000	0.00	0	10/ 0.0/ 0.0	0	0
**TOTAL COMMUNITY HEALTH-----------------------				137971		6215	9370

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PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATES CONTINUED -
DIRECT CLIENT CARE

**NURSE PRACTITIONERS - INCLUDED IN THE ABOVE PROJECTIONS ARE THE FOLLOWING NUMBER OF RNS WITH NURSE PRACTITIONER PREPARATION AND SKILLS

	1982		
	NO. OF DCC RN	PERCENT NRS.PRACT.	NO. OF NRS.PRACT.
HOSPITAL AMBULATORY CARE(41)	30279	10.00	3027
NURSING HOMES(42)	85266	2.75	2344
PHYSICIANS OFFICES(43)	51580	15.00	7737
COMMUNITY HEALTH(44)	137971	10.00	13797

	1982					
	AVE.DAILY CENSUS	CS/100 CENSUS	TOTAL FTE RN	RN/LPN/AIDE RATIO	TOTAL LPN	TOTAL AIDE
**CLINICAL SPECIALISTS						
*LONG TERM HOSPITALS						
PSYCHIATRIC(45)	227256	2.00	4545	10/ 0.0/ 0.0	0	0
ALL OTHER LONG TERM(46)	130587	2.00	2611	10/ 0.0/ 0.0	0	0
*SHORT TERM HOSPITALS						
SMALL(47)	114454	2.00	2289	10/ 0.0/ 0.0	0	0
LARGE,TEACHING(48)	347779	3.00	10433	10/ 0.0/ 0.0	0	0
ALL OTHER SHORT TERM(49)	475165	2.00	9503	10/ 0.0/ 0.0	0	0
*NURSING HOMES						
NURSING CARE HOMES(50)	892986	0.50	4464	10/ 0.0/ 0.0	0	0
PERSONAL CARE HOMES W/NSG(51)	97971	0.20	195	10/ 0.0/ 0.0	0	0
	FTE DCC RN	CS/10 DCC RN	TOTAL FTE RN	RN/LPN/AIDE RATIO	TOTAL LPN	TOTAL AIDE
*HOSPITAL AMBULATORY CARE (EMERGENCY + OUTPATIENT)(52)	30279	0.50	1513	10/ 0.0/ 0.0	0	0
*COMMUNITY HEALTH						
HOME HEALTH CARE(53)	20403	0.50	1020	10/ 0.0/ 0.0	0	0
GENERAL PUBLIC HEALTH(54)	30954	0.50	1547	10/ 0.0/ 0.0	0	0
CLINIC(55)	21354	0.50	1067	10/ 0.0/ 0.0	0	0
SCHOOL HEALTH(56)	30506	0.50	1525	10/ 0.0/ 0.0	0	0
OCCUPATIONAL HEALTH(57)	34754	0.50	1737	10/ 0.0/ 0.0	0	0
OTHER(58)	0	0.50	0	10/ 0.0/ 0.0	0	0
**TOTAL CLINICAL SPECIALISTS--------------------			42449		0	0
***TOTAL DIRECT CLIENT CARE----------------------			968189		405719	466550

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PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATE - EDUCATIONAL PREPARATION OF DIRECT CLIENT CARE RNS	1982									
	TOTAL	PERCENT				NUMBER			
	FTE RN	DOCT.	MAST.	BACC.	AD/DIP	DOCT.	MAST.	BACC.	AD/DIP
**INPATIENT SERVICES									
*LONG TERM HOSPITALS									
*PSYCHIATRIC(59)	29543	0.00	0.00	50.00	50.00	0	0	14771	14771
*ALL OTHER LONG TERM									
GENERAL UNIT(60)	54505	0.00	0.00	50.00	50.00	0	0	27252	27252
CRITICAL CARE UNIT(61)	1502	0.00	0.00	50.00	50.00	0	0	751	751
SELF CARE UNIT(62)	0	0.00	0.00	0.00	0.00	0	0	0	0
EXTENDED CARE UNIT(63)	2142	0.00	0.00	50.00	50.00	0	0	1071	1071
REHABILITATION UNIT(64)	1196	0.00	0.00	50.00	50.00	0	0	598	598
PSYCHIATRIC UNIT(65)	708	0.00	0.00	50.00	50.00	0	0	354	354
*SHORT TERM HOSPITALS									
*SMALL,UNDER 100 BEDS(66)	56082	0.00	0.00	50.00	50.00	0	0	28041	28041
*LARGE,OVER 400 BEDS,TEACHING									
NEWBORN UNIT(67)	8360	0.00	0.00	20.00	80.00	0	0	1672	6688
GENERAL UNIT(68)	137770	0.00	0.00	50.00	50.00	0	0	68885	68885
CRITICAL CARE UNIT(69)	25048	0.00	0.00	50.00	50.00	0	0	12524	12524
SELF CARE UNIT(70)	0	0.00	0.00	0.00	0.00	0	0	0	0
EXTENDED CARE UNIT(71)	2069	0.00	0.00	50.00	50.00	0	0	1034	1034
REHABILITATION UNIT(72)	2312	0.00	0.00	50.00	50.00	0	0	1156	1156
PSYCHIATRIC UNIT(73)	10761	0.00	0.00	50.00	50.00	0	0	5380	5380
*ALL OTHER SHORT TERM									
NEWBORN UNIT(74)	17871	0.00	0.00	20.00	80.00	0	0	3574	14296
GENERAL UNIT(75)	187655	0.00	0.00	50.00	50.00	0	0	93827	93827
CRITICAL CARE UNIT(76)	43564	0.00	0.00	50.00	50.00	0	0	21782	21782
SELF CARE UNIT(77)	0	0.00	0.00	0.00	0.00	0	0	0	0
EXTENDED CARE UNIT(78)	3377	0.00	0.00	50.00	50.00	0	0	1688	1688
REHABILITATION UNIT(79)	1571	0.00	0.00	50.00	50.00	0	0	785	785
PSYCHIATRIC UNIT(80)	6784	0.00	0.00	50.00	50.00	0	0	3392	3392
**OTHER HOSPITAL SERVICES									
SURGICAL OPERATIONS(81)	27824	0.00	0.00	0.00	100.00	0	0	0	27824
EMERGENCY VISITS(82)	18449	0.00	0.00	50.00	50.00	0	0	9224	9224
OUTPATIENT CLINIC VISITS(83)	11830	0.00	10.00	80.00	10.00	0	1183	9464	1183
**TOTAL HOSPITAL-BASED DIRECT CLIENT CARE------------------	650923					0	1183	307225	342506

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***ESTIMATE CONTINUED	1982								
EDUCATIONAL PREPARATION OF DIRECT CLIENT CARE RNS	TOTAL FTE RN	PERCENT				NUMBER			
		DOCT.	MAST.	BACC.	AD/DIP	DOCT.	MAST.	BACC.	AD/DIP
**NURSING HOMES									
*NURSING CARE HOMES(84)	80368	0.00	0.00	50.00	50.00	0	0	40184	40184
*PERSONAL CARE HOMES W/NSNG(85)	4898	0.00	0.00	50.00	50.00	0	0	2449	2449
**PHYSICIANS OFFICES(86)	51580	0.00	25.00	25.00	50.00	0	12895	12895	25790
**COMMUNITY HEALTH									
HOME HEALTH CARE(87)	20403	0.00	10.00	75.00	15.00	0	2040	15302	3060
GENERAL PUBLIC HEALTH(88)	30954	0.00	10.00	90.00	0.00	0	3095	27858	0
CLINIC(89)	21354	0.00	10.00	75.00	15.00	0	2135	16015	3203
SCHOOL HEALTH(90)	30506	0.00	10.00	90.00	0.00	0	3050	27455	0
OCCUPATIONAL HEALTH(91)	34754	0.00	10.00	90.00	0.00	0	3475	31278	0
OTHER(92)	0	0.00	10.00	90.00	0.00	0	0	0	0
**CLINICAL SPECIALISTS									
*LONG TERM HOSPITALS									
PSYCHIATRIC(93)	4545	0.00	100.00	0.00	0.00	0	4545	0	0
ALL OTHER LONG TERM(94)	2611	0.00	100.00	0.00	0.00	0	2611	0	0
*SHORT TERM HOSPITALS									
SMALL(95)	2289	0.00	100.00	0.00	0.00	0	2289	0	0
LARGE,TEACHING(96)	10433	0.00	100.00	0.00	0.00	0	10433	0	0
ALL OTHER SHORT TERM(97)	9503	0.00	100.00	0.00	0.00	0	9503	0	0
*NURSING HOMES									
NURSING CARE HOMES(98)	4464	0.00	100.00	0.00	0.00	0	4464	0	0
PERSONAL CARE HOMES W/NSNG(99)	195	0.00	100.00	0.00	0.00	0	195	0	0
*HOSPITAL AMBULATORY CARE (EMERGENCY * OUTPATIENT)(100)	1513	0.00	100.00	0.00	0.00	0	1513	0	0
*COMMUNITY HEALTH									
HOME HEALTH CARE(101)	1020	0.00	100.00	0.00	0.00	0	1020	0	0
GENERAL PUBLIC HEALTH(102)	1547	0.00	100.00	0.00	0.00	0	1547	0	0
CLINIC(103)	1067	0.00	100.00	0.00	0.00	0	1067	0	0
SCHOOL HEALTH(104)	1525	0.00	100.00	0.00	0.00	0	1525	0	0
OCCUPATIONAL HEALTH(105)	1737	0.00	100.00	0.00	0.00	0	1737	0	0
OTHER(106)	0	0.00	100.00	0.00	0.00	0	0	0	0
***TOTAL DIRECT CLIENT CARE	968189					0	70322	480661	417192

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PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATE - RNS IN ADMINISTRATIVE POSITIONS	1975 NO.OF INSTITUTIONS	1982 NO.OF INSTITUTIONS	1982 ADMINISTRATORS/ INSTITUTION	1982 TOTAL FTE ADMINISTRATORS
**EXECUTIVE/PRINCIPAL NURSE ADMIN.				
*HOSPITAL INPATIENT				
*LONG TERM HOSPITALS				
PSYCHIATRIC(107)	334	366	1.00	366
ALL OTHER LONG TERM(108)	359	393	1.00	393
*SHORT TERM HOSPITALS				
SMALL(109)	3346	3663	1.00	3663
LARGE,TEACHING(110)	526	572	3.00	1716
ALL OTHER SHORT TERM(111)	2591	2836	2.00	5672
*HOSPITAL OUTPATIENT(112)	6797	7440	0.00	0
*NURSING HOMES				
NURSING CARE HOMES(113)	10098(1973)	11546	1.00	11546
PERSONAL CARE HOMES W/NSNG(114)	964(1973)	1102	1.00	1102
*COMMUNITY HEALTH(115)	4325(1972)	4780	1.00	4780
**TOTAL EXEC/PRIN ADMIN------------------------				29238

**MID-LEVEL NURSE ADMIN./MANAGERS	1982 NO.OF DCC RN	1982 ADMINISTRATORS/ 10 DCC RNS	1982 TOTAL FTE ADMINISTRATORS
*HOSPITAL INPATIENT			
*LONG TERM HOSPITALS			
PSYCHIATRIC(116)	34088	1.00	3408
ALL OTHER LONG TERM(117)	62664	1.00	6266
*SHORT TERM HOSPITALS			
SMALL(118)	58371	1.00	5837
LARGE,TEACHING(119)	196753	2.00	39350
ALL OTHER SHORT TERM(120)	270325	1.60	43252
*HOSPITAL OUTPATIENT(121)	31792	1.00	3179
*NURSING HOMES			
NURSING CARE HOMES(122)	84832	1.00	8483
PERSONAL CARE HOMES W/NSNG(123)	5093	0.50	254
*COMMUNITY HEALTH(124)	144867	1.00	14486
**TOTAL MID-LEVEL ADMIN------------------------			124515
***TOTAL RNS IN ADMINISTRATIVE POSITIONS----------			153753

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PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATE - EDUCATIONAL PREPARATION OF RNS IN ADMINISTRATIVE POSITIONS	1982								
	TOTAL FTE RN	PERCENT				NUMBER			
		DOCT.	MAST.	BACC.	AD/DIP	DOCT.	MAST.	BACC.	AD/DIP
**EXECUTIVE/PRINCIPAL NURSE ADMIN.									
*HOSPITAL INPATIENT									
*LONG TERM HOSPITALS									
PSYCHIATRIC(125)	366	5.00	95.00	0.00	0.00	18	347	0	0
ALL OTHER LONG TERM(126)	393	5.00	95.00	0.00	0.00	19	373	0	0
*SHORT TERM HOSPITALS									
SMALL(127)	3663	5.00	95.00	0.00	0.00	183	3479	0	0
LARGE,TEACHING(128)	1716	5.00	95.00	0.00	0.00	85	1630	0	0
ALL OTHER SHORT TERM(129)	5672	5.00	95.00	0.00	0.00	283	5388	0	0
*HOSPITAL OUTPATIENT(130)	0	5.00	95.00	0.00	0.00	0	0	0	0
*NURSING HOMES									
NURSING CARE HOMES(131)	11546	5.00	95.00	0.00	0.00	577	10968	0	0
PERSONAL CARE HOMES W/NSNG(132)	1102	5.00	95.00	0.00	0.00	55	1046	0	0
*COMMUNITY HEALTH(133)	4780	5.00	95.00	0.00	0.00	239	4541	0	0
**TOTAL EXEC/PRIN ADMIN---------------	29238					1459	27772	0	0
**MID-LEVEL NURSE ADMIN./MANAGERS									
*HOSPITAL INPATIENT									
*LONG TERM HOSPITALS									
PSYCHIATRIC(134)	3408	0.00	25.00	75.00	0.00	0	852	2556	0
ALL OTHER LONG TERM(135)	6266	0.00	25.00	75.00	0.00	0	1566	4699	0
*SHORT TERM HOSPITALS									
SMALL(136)	5837	0.00	25.00	75.00	0.00	0	1459	4377	0
LARGE,TEACHING(137)	39350	0.00	25.00	75.00	0.00	0	9837	29512	0
ALL OTHER SHORT TERM(138)	43252	0.00	25.00	75.00	0.00	0	10813	32439	0
*HOSPITAL OUTPATIENT(139)	3179	0.00	25.00	75.00	0.00	0	794	2384	0
*NURSING HOMES									
NURSING CARE HOMES(140)	8483	0.00	25.00	75.00	0.00	0	2120	6362	0
PERSONAL CARE HOMES W/NSNG(141)	254	0.00	25.00	75.00	0.00	0	63	190	0
*COMMUNITY HEALTH(142)	14486	0.00	25.00	75.00	0.00	0	3621	10864	0
**TOTAL MID-LEVEL ADMIN---------------	124515					0	31125	93383	0
***TOTAL RNS IN ADMINISTRATIVE POSITIONS----------------------------	153753					1459	58897	93383	0

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                                    OF NURSING PERSONNEL AND SERVICES

                                  PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATES - IN-SERVICE                  1975       ----------------------1982--------------------------------
  INSTRUCTORS,RESEARCHERS,AND             NO.OF          NO.OF            INSTRUCTORS/                   TOTAL FTE
  CONSULTANTS                          INSTITUTIONS   INSTITUTIONS        INSTITUTION                    INSTRUCTORS

  **IN-SERVICE INSTRUCTORS
    *SHORT TERM,LARGE
      TEACHING HOSPITALS(143)              526            572                3.00                          1716
    *ALL OTHER HOSPITALS
      AND NURSING CARE HOMES(144)        23525          26244                0.50                         13122
    *COMMUNITY HEALTH(145)                4325(1972)     4780                0.50                          2390

                                                  ----------------------1982--------------------------------
                                                       FTE              RES.-CONSLT./                    TOTAL FTE
  **RESEARCHERS                                       OCC RN             10 OCC RN                      RES.+CONSLT
    AND CONSULTANTS
    (BASED ON OCC RN)(146)                           968189                0.10                          9681

  **TOTAL IN-SERVICE INSTRUCTORS,
    RESEARCHERS AND CONSULTANTS------------------                                                       26909

                                     ------------------------------------1982---------------------------------------
                                      TOTAL    -----------PERCENT------------           ----------NUMBER-------------
                                      FTE RN   DOCT.   MAST.   BACC.  AD/DIP            DOCT.   MAST.   BACC.  AD/DIP

  **IN-SERVICE INSTRUCTORS
    *SHORT TERM,LARGE
      TEACHING HOSPITALS(147)          1716    0.00  100.00    0.00    0.00                0    1716       0       0
    *ALL OTHER HOSPITALS
      AND NURSING CARE HOMES(148)     13122    0.00  100.00    0.00    0.00                0   13122       0       0
    *COMMUNITY HEALTH(149)             2390    0.00  100.00    0.00    0.00                0    2390       0       0

  **RESEARCHERS
    AND CONSULTANTS(150)               9681   50.00   50.00    0.00    0.00             4840    4840       0       0



***TOTAL IN-SERVICE INSTRUCTORS,
  RESEARCHERS,AND CONSULTANTS----------- 26909                                          4840   22068       0       0
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PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATES - RNS IN SCHOOLS OF NURSING	1973 NO.OF STUDENTS	1982 NO.OF STUDENTS	1982 FACULTY/ 10 STUDENTS	1982 TOTAL FTE FACULTY
**FACULTY				
DOCTORAL PROGRAM(151)	375	880	1.67	146
MASTERS PROGRAM(152)	6714	8020	1.67	1339
BACCALAUREATE PROGRAM(153)	85156	132100	1.25	16512
ASSOCIATE PROGRAM(154)	78673	75200	1.00	7520
DIPLOMA PROGRAM(155)	68760	39400	1.00	3940
LPN/LVN PROGRAM(156)	56267	58850	1.00	5885
TOTAL FACULTY-------------------------				35342

	1973 NO.OF PROGRAMS	1982 NO.OF PROGRAMS	1982 FTE FACULTY	1982 ADMINISTRATORS/ PROGRAM	1982 ADMIN/ 10 FACULTY	1982 TOTAL FTE ADMIN
**SCHOOL ADMINISTRATORS						
DOCTORAL PROGRAM(157)	8	19	146	1.00	0.00	19
MASTERS PROGRAM(158)	87	104	1339	1.00	0.00	104
BACCALAUREATE PROGRAM(159)	302	470	16512	3.00	0.00	1410
ASSOCIATE PROGRAM(160)	565	540	7520	1.00	0.00	540
DIPLOMA PROGRAM(161)	493	280	3940	1.00	0.00	280
LPN/LVN PROGRAM(162)	1283	1340	5885	1.00	0.00	1340
TOTAL SCHOOL ADMINISTRATORS-----------						3693

***TOTAL RNS IN SCHOOLS OF NURSING--------------------------- 39035

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PANEL OF EXPERT CONSULTANTS - LOWER BOUND

***ESTIMATES EDUCATIONAL PREPARATION OF RNS IN SCHOOLS OF NURSING	1982 TOTAL FTE RN	PERCENT DOCT.	 MAST.	 BACC.	 AD/DIP	NUMBER DOCT.	 MAST.	 BACC.	 AD/DIP
**FACULTY									
DOCTORAL PROGRAM(163)	146	100.00	0.00	0.00	0.00	146	0	0	0
MASTERS PROGRAM(164)	1339	75.00	25.00	0.00	0.00	1004	334	0	0
BACCALAUREATE PROGRAM(165)	16512	20.00	80.00	0.00	0.00	3302	13209	0	0
ASSOCIATE PROGRAM(166)	7520	10.00	90.00	0.00	0.00	752	6768	0	0
DIPLOMA PROGRAM(167)	3940	10.00	90.00	0.00	0.00	394	3546	0	0
LPN/LVN PROGRAM(168)	5885	0.00	60.00	40.00	0.00	0	3531	2354	0
**TOTAL FACULTY----------------------	35342					5598	27388	2354	0
**SCHOOL ADMINISTRATORS									
DOCTORAL PROGRAM(169)	19	100.00	0.00	0.00	0.00	19	0	0	0
MASTERS PROGRAM(170)	104	100.00	0.00	0.00	0.00	104	0	0	0
BACCALAUREATE PROGRAM(171)	1410	100.00	0.00	0.00	0.00	1410	0	0	0
ASSOCIATE PROGRAM(172)	540	25.00	75.00	0.00	0.00	135	405	0	0
DIPLOMA PROGRAM(173)	280	25.00	75.00	0.00	0.00	70	210	0	0
LPN/LVN PROGRAM(174)	1340	0.00	100.00	0.00	0.00	0	1340	0	0
**TOTAL SCHOOL ADMINISTRATORS---------	3693					1738	1955	0	0
***TOTAL RNS IN SCHOOLS OF NURSING--------------------------	39035					7336	29343	2354	0

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***ESTIMATES - PRIVATE DUTY AND RNS IN HEALTH RELATED ORGANIZATIONS	1982 RN/10K POPULATION	 TOTAL FTE RN
**PRIVATE DUTY(175)	1.00	22478
**HEALTH-RELATED ORGANIZATIONS(176)	0.40	8991

	1982 TOTAL FTE RN	PERCENT DOCT.	 MAST.	 BACC.	 AD/DIP	NUMBER DOCT.	 MAST.	 BACC.	 AD/DIP
PRIVATE DUTY(177)	22478	0.00	0.00	20.00	80.00	0	0	4495	17982
HEALTH-RELATED ORGANIZATIONS(178)	8991	10.00	90.00	0.00	0.00	899	8091	0	0

APPENDIX B
PART 1

UNITED STATES OF AMERICA — REQUIREMENTS

ANALYSIS AND PLANNING FOR IMPROVED DISTRIBUTION OF NURSING PERSONNEL AND SERVICES

PANEL OF EXPERT CONSULTANTS - LOWER BOUND

******SUMMARY*******
PROJECTION OF NURSING REQUIREMENTS, 1982

	TOTAL FTE RN	------RN BY EDUCATION LEVEL-----[2] DOCT.	MAST.	BACC.	AD/DIP	TOTAL LPN	TOTAL AIDE
***DIRECT CLIENT CARE							
HOSPITALS	681817	0	32077	307225	342506	173314	236668
NURSING HOMES	89925	0	4659	42633	42633	210716	220512
PHYSICIANS OFFICES	51580	0	12895	12895	25790	15474	
COMMUNITY HEALTH	144867	0	20691	117908	6263	6215	9370
TOTAL------------------------------	968189	0	70322	480661	417192	405719	466550
***ADMINISTRATORS							
EXECUTIVE/PRINCIPAL NURSE ADMIN.	29238	1459	27772	0	0		
MID-LEVEL NURSE ADMIN./MANAGERS	124515	0	31125	93383	0		
TOTAL------------------------------	153753	1459	58897	93383	0		
***IN-SERVICE INSTRUCTORS	17228	0	17228	0	0		
***RESEARCHERS AND CONSULTANTS	9681	4840	4840	0	0		
***SCHOOLS OF NURSING							
FACULTY	35342	5598	27388	2354	0		
SCHOOL ADMINISTRATORS	3693	1738	1955	0	0		
TOTAL------------------------------	39035	7336	29343	2354	0		
***PRIVATE DUTY	22478	0	0	4495	17982		
***HEALTH-RELATED ORGANIZATIONS	8991	899	8091	0	0		
*****GRAND TOTAL-----------------------	1219355	14534	188721	580893	435174	405719	466550

THE TOTAL NUMBER OF NURSES WITHIN THE DIRECT CLIENT CARE CATEGORY INCLUDES 42449 CLINICAL SPECIALISTS.
26905 OF THE DIRECT CLIENT CARE NURSES PROJECTED ARE TO HAVE PRACTITIONER PREPARATION AND SKILLS.

DEVELOPED BY THE WESTERN INTERSTATE COMMISSION FOR HIGHER EDUCATION
AND THE NATIONAL CENTER FOR HIGHER EDUCATION MANAGEMENT SYSTEMS

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[2] The number of RNs by educational preparation may not equal the total number of FTE RNs due to the calculation procedure.

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REQUIREMENTS

ANALYSIS AND PLANNING
FOR IMPROVED DISTRIBUTION
OF NURSING PERSONNEL AND SERVICES

PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATE - POPULATION

	1974	1982
*COUNT BY AGE		
UNDER 17 YEARS(2)	63117000	59351000
AGE 17 - 64 YEARS(3)	124577000	140139000
OVER 64 YEARS(4)	21824000	25295000
*TOTAL	209518000	224785000

	1974	1982
*INFANTS		
LIVE BIRTHS(5)	3160000	3985800
DEATHS 1 MONTH TO 1 YEAR OF AGE(6)	52300	66000

***ESTIMATES DIRECT CLIENT CARE NURSING PERSONNEL	1975 BEDS/10K POPULATION	1982 BEDS/10K POPULATION	1982 OCCUP. RATE	1982 AVE.DAILY CENSUS	1982 RN/100 PATIENTS	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**INPATIENT SERVICES									
*LONG TERM HOSPITALS									
*PSYCHIATRIC(7)	11.99	11.99	84.32	227256	22.00	49996	10/ 4.5/13.6	22498	67994
*ALL OTHER LONG TERM									
GENERAL UNIT(8)	5.92	5.92	83.59	111235	56.50	62847	10/ 2.1/ 2.1	13197	13197
CRITICAL CARE UNIT(9)	0.04	0.04	83.59	751	250.00	1877	10/ 0.0/ 0.0	0	0
SELF CARE UNIT(10)	0.11	0.00	83.59	0	0.00	0	10/ 0.0/ 0.0	0	0
EXTENDED CARE UNIT(11)	0.57	0.57	83.59	10710	30.00	3213	10/ 6.7/ 6.7	2152	2152
REHABILITATION UNIT(12)	0.13	0.13	83.59	2442	56.50	1379	10/ 2.1/ 2.1	289	289
PSYCHIATRIC UNIT(13)	0.29	0.29	83.59	5449	22.00	1198	10/ 4.5/13.6	539	1629
*SHORT TERM HOSPITALS									
*SMALL UNDER 100 BEDS(14)	8.29	8.29	61.42	114454	56.50	64666	10/ 2.1/ 2.1	13579	13579
*LARGE,OVER 400 BEDS,TEACHING									
NEWBORN UNIT(15)	0.95	0.94	80.75	17062	56.50	9640	10/ 2.1/ 2.1	2024	2024
GENERAL UNIT(16)	15.49	15.49	80.75	281165	56.50	158858	10/ 2.1/ 2.1	33360	33360
CRITICAL CARE UNIT(17)	0.69	0.69	80.75	12524	250.00	31310	10/ 0.0/ 0.0	0	0
SELF CARE UNIT(18)	0.11	0.00	80.75	0	0.00	0	10/ 0.0/ 0.0	0	0
EXTENDED CARE UNIT(19)	0.57	0.57	80.75	10346	30.00	3103	10/ 6.7/ 6.7	2079	2079
REHABILITATION UNIT(20)	0.26	0.26	80.75	4719	56.50	2666	10/ 2.1/ 2.1	559	559
PSYCHIATRIC UNIT(21)	1.21	1.21	80.75	21963	56.50	12409	10/ 0.0/ 4.2	0	5211
*ALL OTHER SHORT TERM									
NEWBORN UNIT(22)	2.16	2.16	75.12	36473	56.50	20607	10/ 2.1/ 2.1	4327	4327
GENERAL UNIT(23)	22.68	22.68	75.12	382971	56.50	216378	10/ 2.1/ 2.1	45439	45439
CRITICAL CARE UNIT(24)	1.29	1.29	75.12	21782	250.00	54455	10/ 0.0/ 0.0	0	0
SELF CARE UNIT(25)	0.14	0.00	75.12	0	0.00	0	10/ 0.0/ 0.0	0	0
EXTENDED CARE UNIT(26)	1.00	1.00	75.12	16885	30.00	5065	10/ 6.7/ 6.7	3393	3393
REHABILITATION UNIT(27)	0.20	0.19	75.12	3208	56.50	1812	10/ 2.1/ 2.1	380	380
PSYCHIATRIC UNIT(28)	0.82	0.82	75.12	13846	56.50	7822	10/ 0.0/ 4.2	0	3285
**TOTAL HOSPITAL INPATIENT----------------------				1295241		709301		143815	198897

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[1] General units include adult med-surg/maternity/pediatrics

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OF NURSING PERSONNEL AND SERVICES**

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

**ESTIMATES CONTINUED - DIRECT CLIENT CARE	1975 SERVICES/10K POPULATION	1982 SERVICES/10K POPULATION	1982 TOTAL SERVICES	1982 RN/1000 SERVICES	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**OTHER HOSPITAL SERVICES								
SURGICAL OPERATIONS(29)	825.23	825.23	18549932	1.80	33389	10/ 0.0/ 2.0	0	6677
EMERGENCY VISITS(30)	3479.79	3730.81	83863012	0.44	36899	10/10.0/ 5.0	36899	18449
OUTPATIENT CLINIC VISITS(31)	4462.54	4784.44	107547034	0.23	24735	10/10.0/ 5.0	24735	12367
**TOTAL HOSPITAL-BASED DIRECT CLIENT CARE----------------------------					804324		205449	236390

	1973 BEDS/10K POP.OVER 64	1982 BEDS/10K POP.OVER 64	1982 OCCUP. RATE	1982 AVE.DAILY RESIDENTS	1982 RN/100 RESDNTS	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**NURSING HOMES									
*NURSING CARE HOMES(32)	379.06	385.94	92.30	901065	20.00	180213	10/20.0/20.0	360426	360426
*PERSONAL CARE HOMES W/NSG(33)	45.41	46.23	83.78	97971	5.00	4898	10/20.0/40.0	9796	19592
**TOTAL NURSING HOME-BASED DIRECT CLIENT CARE----------------------------				999036		185111		370222	380018

	1973 NO.OF MDS	1982 NO.OF MDS	1982 RN/10 MDS	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
**PHYSICIANS OFFICES(34)	197600	257900	2.20	56738	10/ 2.0/ 0.0	11347	0

**COMMUNITY HEALTH	POPULATION BASE	1982 POPULATION	1982 RN/10K POP.	1982 TOTAL FTE RN	1982 RN/LPN/AIDE RATIO	1982 TOTAL LPN	1982 TOTAL AIDE
HOME HEALTH CARE(35)	TOTAL POPULATION	224785000	0.98	22028	10/ 1.4/ 2.0	3083	4405
	OVER 64 YEARS	25295000	3.44	8701	10/ 1.4/ 2.0	1218	1740
GENERAL PUBLIC HEALTH(36)	LIVE BIRTHS	3985800	6.33	2523	10/ 0.0/ 0.0	0	0
	INFANT DEATHS	66000	33.27	219	10/ 0.0/ 0.0	0	0
	UNDER 17 YEARS	59351000	1.81	10742	10/ 0.0/ 0.0	0	0
	17 YEARS AND OVER	165434000	1.81	29943	10/ 0.0/ 0.0	0	0
CLINIC(37)	TOTAL POPULATION	224785000	1.43	32144	10/ 1.0/ 2.0	3214	6428
SCHOOL HEALTH(38)	UNDER 17 YEARS	59351000	10.28	61012	10/ 0.0/ 0.0	0	0
OCCUPATIONAL HEALTH(39)	AGE 17-64 YEARS	140139000	2.48	34754	10/ 0.0/ 0.0	0	0
OTHER(40)	TOTAL POPULATION	224785000	0.00	0	10/ 0.0/ 0.0	0	0
**TOTAL COMMUNITY HEALTH------------------------				202066		7515	12573

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

**ESTIMATES CONTINUED -
IRECT CLIENT CARE

**NURSE PRACTITIONERS - INCLUDED IN THE ABOVE PROJECTIONS ARE THE FOLLOWING NUMBER OF RNS WITH NURSE PRACTITIONER PREPARATION AND SKILLS

	1982		
	NO. OF DCC RN	PERCENT NRS.PRACT.	NO. OF NRS.PRACT.
HOSPITAL AMBULATORY CARE(41)	61634	13.00	8012
NURSING HOMES(42)	185111	2.50	4627
PHYSICIANS OFFICES(43)	56738	25.00	14184
COMMUNITY HEALTH(44)	202066	15.00	30309

	1982					
	AVE.DAILY CENSUS	CS/100 CENSUS	TOTAL FTE RN	RN/LPN/AIDE RATIO	TOTAL LPN	TOTAL AIDE
**CLINICAL SPECIALISTS						
*LONG TERM HOSPITALS						
PSYCHIATRIC(45)	227256	4.00	9090	10/ 0.0/ 0.0	0	0
ALL OTHER LONG TERM(46)	130587	4.00	5223	10/ 0.0/ 0.0	0	0
*SHORT TERM HOSPITALS						
SMALL(47)	114454	4.00	4578	10/ 0.0/ 0.0	0	0
LARGE,TEACHING(48)	347779	5.00	17388	10/ 0.0/ 0.0	0	0
ALL OTHER SHORT TERM(49)	475165	4.00	19006	10/ 0.0/ 0.0	0	0
*NURSING HOMES						
NURSING CARE HOMES(50)	901065	1.00	9010	10/ 0.0/ 0.0	0	0
PERSONAL CARE HOMES W/NSG(51)	97971	0.30	293	10/ 0.0/ 0.0	0	0
	FTE DCC RN	CS/10 DCC RN	TOTAL FTE RN	RN/LPN/AIDE RATIO	TOTAL LPN	TOTAL AIDE
*HOSPITAL AMBULATORY CARE (EMERGENCY + OUTPATIENT)(52)	61634	0.50	3081	10/ 0.0/ 0.0	0	0
*COMMUNITY HEALTH						
HOME HEALTH CARE(53)	30729	0.50	1536	10/ 0.0/ 0.0	0	0
GENERAL PUBLIC HEALTH(54)	43427	0.50	2171	10/ 0.0/ 0.0	0	0
CLINIC(55)	32144	0.50	1607	10/ 0.0/ 0.0	0	0
SCHOOL HEALTH(56)	61012	0.50	3050	10/ 0.0/ 0.0	0	0
OCCUPATIONAL HEALTH(57)	34754	0.50	1737	10/ 0.0/ 0.0	0	0
OTHER(58)	0	0.50	0	10/ 0.0/ 0.0	0	0
**TOTAL CLINICAL SPECIALISTS-------------------			77770		0	0
***TOTAL DIRECT CLIENT CARE----------------------			1326009		594533	628981

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATE - EDUCATIONAL PREPARATION OF DIRECT CLIENT CARE RNS	1982								
	TOTAL FTE RN	PERCENT				NUMBER			
		DOCT.	MAST.	BACC.	AD/DIP	DOCT.	MAST.	BACC.	AD/DIP
**INPATIENT SERVICES									
*LONG TERM HOSPITALS									
*PSYCHIATRIC(59)	49996	0.00	0.00	50.00	50.00	0	0	24998	24998
*ALL OTHER LONG TERM									
GENERAL UNIT(60)	62847	0.00	0.00	50.00	50.00	0	0	31423	31423
CRITICAL CARE UNIT(61)	1877	0.00	0.00	50.00	50.00	0	0	938	938
SELF CARE UNIT(62)	0	0.00	0.00	0.00	0.00	0	0	0	0
EXTENDED CARE UNIT(63)	3213	0.00	0.00	50.00	50.00	0	0	1606	1606
REHABILITATION UNIT(64)	1379	0.00	0.00	50.00	50.00	0	0	689	689
PSYCHIATRIC UNIT(65)	1198	0.00	0.00	50.00	50.00	0	0	599	599
*SHORT TERM HOSPITALS									
*SMALL,UNDER 100 BEDS(66)	64666	0.00	0.00	50.00	50.00	0	0	32333	32333
*LARGE,OVER 400 BEDS,TEACHING									
NEWBORN UNIT(67)	9640	0.00	0.00	20.00	80.00	0	0	1928	7712
GENERAL UNIT(68)	158858	0.00	0.00	50.00	50.00	0	0	79429	79429
CRITICAL CARE UNIT(69)	31310	0.00	0.00	50.00	50.00	0	0	15655	15655
SELF CARE UNIT(70)	0	0.00	0.00	0.00	0.00	0	0	0	0
EXTENDED CARE UNIT(71)	3103	0.00	0.00	50.00	50.00	0	0	1551	1551
REHABILITATION UNIT(72)	2666	0.00	0.00	50.00	50.00	0	0	1333	1333
PSYCHIATRIC UNIT(73)	12409	0.00	0.00	50.00	50.00	0	0	6204	6204
*ALL OTHER SHORT TERM									
NEWBORN UNIT(74)	20607	0.00	0.00	20.00	80.00	0	0	4121	16485
GENERAL UNIT(75)	216378	0.00	0.00	50.00	50.00	0	0	108189	108189
CRITICAL CARE UNIT(76)	54455	0.00	0.00	50.00	50.00	0	0	27227	27227
SELF CARE UNIT(77)	0	0.00	0.00	0.00	0.00	0	0	0	0
EXTENDED CARE UNIT(78)	5065	0.00	0.00	50.00	50.00	0	0	2532	2532
REHABILITATION UNIT(79)	1812	0.00	0.00	50.00	50.00	0	0	906	906
PSYCHIATRIC UNIT(80)	7822	0.00	0.00	50.00	50.00	0	0	3911	3911
**OTHER HOSPITAL SERVICES									
SURGICAL OPERATIONS(81)	33389	0.00	0.00	0.00	100.00	0	0	0	33389
EMERGENCY VISITS(82)	36899	0.00	0.00	50.00	50.00	0	0	18449	18449
OUTPATIENT CLINIC VISITS(83)	24735	0.00	10.00	80.00	10.00	0	2473	19788	2473
**TOTAL HOSPITAL-BASED DIRECT CLIENT CARE------------------	804324					0	2473	383809	418031

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATE CONTINUED - EDUCATIONAL PREPARATION OF DIRECT CLIENT CARE RNS	1982								
	TOTAL FTE RN	PERCENT				NUMBER			
		DOCT.	MAST.	BACC.	AD/DIP	DOCT.	MAST.	BACC.	AD/DIP
**NURSING HOMES									
*NURSING CARE HOMES(84)	180213	0.00	0.00	50.00	50.00	0	0	90106	90106
*PERSONAL CARE HOMES W/NSNG(85)	4898	0.00	0.00	50.00	50.00	0	0	2449	2449
**PHYSICIANS OFFICES(86)	56738	0.00	25.00	25.00	50.00	0	14184	14184	28369
**COMMUNITY HEALTH									
HOME HEALTH CARE(87)	30729	0.00	10.00	75.00	15.00	0	3072	23046	4609
GENERAL PUBLIC HEALTH(88)	43427	0.00	10.00	90.00	0.00	0	4342	39084	0
CLINIC(89)	32144	0.00	10.00	75.00	15.00	0	3214	24108	4821
SCHOOL HEALTH(90)	61012	0.00	10.00	90.00	0.00	0	6101	54910	0
OCCUPATIONAL HEALTH(91)	34754	0.00	10.00	90.00	0.00	0	3475	31278	0
OTHER(92)	0	0.00	10.00	90.00	0.00	0	0	0	0
**CLINICAL SPECIALISTS									
*LONG TERM HOSPITALS									
PSYCHIATRIC(93)	9090	0.00	100.00	0.00	0.00	0	9090	0	0
ALL OTHER LONG TERM(94)	5223	0.00	100.00	0.00	0.00	0	5223	0	0
*SHORT TERM HOSPITALS									
SMALL(95)	4578	0.00	100.00	0.00	0.00	0	4578	0	0
LARGE,TEACHING(96)	17388	0.00	100.00	0.00	0.00	0	17388	0	0
ALL OTHER SHORT TERM(97)	19006	0.00	100.00	0.00	0.00	0	19006	0	0
*NURSING HOMES									
NURSING CARE HOMES(98)	9010	0.00	100.00	0.00	0.00	0	9010	0	0
PERSONAL CARE HOMES W/NSNG(99)	293	0.00	100.00	0.00	0.00	0	293	0	0
*HOSPITAL AMBULATORY CARE (EMERGENCY + OUTPATIENT)(100)	3081	0.00	100.00	0.00	0.00	0	3081	0	0
*COMMUNITY HEALTH									
HOME HEALTH CARE(101)	1536	0.00	100.00	0.00	0.00	0	1536	0	0
GENERAL PUBLIC HEALTH(102)	2171	0.00	100.00	0.00	0.00	0	2171	0	0
CLINIC(103)	1607	0.00	100.00	0.00	0.00	0	1607	0	0
SCHOOL HEALTH(104)	3050	0.00	100.00	0.00	0.00	0	3050	0	0
OCCUPATIONAL HEALTH(105)	1737	0.00	100.00	0.00	0.00	0	1737	0	0
OTHER(106)	0	0.00	100.00	0.00	0.00	0	0	0	0
***TOTAL DIRECT CLIENT CARE------------	1326009					0	114631	662974	548385

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATE - RNS IN ADMINISTRATIVE POSITIONS	1975 NO.OF INSTITUTIONS	1982 NO.OF INSTITUTIONS	 ADMINISTRATORS/ INSTITUTION	 TOTAL FTE ADMINISTRATORS
**EXECUTIVE/PRINCIPAL NURSE ADMIN.				
*HOSPITAL INPATIENT				
*LONG TERM HOSPITALS				
PSYCHIATRIC(107)	334	366	1.00	366
ALL OTHER LONG TERM(108)	359	393	1.00	393
*SHORT TERM HOSPITALS				
SMALL(109)	3346	3663	1.00	3663
LARGE,TEACHING(110)	526	572	3.00	1716
ALL OTHER SHORT TERM(111)	2591	2836	2.00	5672
*HOSPITAL OUTPATIENT(112)	6797	7448	0.00	0
*NURSING HOMES				
NURSING CARE HOMES(113)	10098(1973)	11546	1.00	11546
PERSONAL CARE HOMES W/NSNG(114)	964(1973)	1102	1.00	1102
*COMMUNITY HEALTH(115)	4325(1972)	4780	1.00	4780
**TOTAL EXEC/PRIN ADMIN------------------------				29238

	1982 NO.OF DCC RN	 ADMINISTRATORS/ 10 DCC RNS	 TOTAL FTE ADMINISTRATORS
**MID-LEVEL NURSE ADMIN./MANAGERS			
*HOSPITAL INPATIENT			
*LONG TERM HOSPITALS			
PSYCHIATRIC(116)	59086	1.00	5908
ALL OTHER LONG TERM(117)	75737	1.00	7573
*SHORT TERM HOSPITALS			
SMALL(118)	69244	1.00	6924
LARGE,TEACHING(119)	235374	2.00	47074
ALL OTHER SHORT TERM(120)	325145	1.60	52023
*HOSPITAL OUTPATIENT(121)	64715	1.00	6471
*NURSING HOMES			
NURSING CARE HOMES(122)	189223	1.00	18922
PERSONAL CARE HOMES W/NSNG(123)	5191	0.50	259
*COMMUNITY HEALTH(124)	212167	1.00	21216
**TOTAL MID-LEVEL ADMIN------------------------			166370
***TOTAL RNS IN ADMINISTRATIVE POSITIONS----------			195608

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REQUIREMENTS

PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATE - EDUCATIONAL PREPARATION OF RNS IN ADMINISTRATIVE POSITIONS	1982									
	TOTAL	PERCENT				NUMBER			
	FTE RN	DOCT.	MAST.	BACC.	AD/DIP	DOCT.	MAST.	BACC.	AD/DIP
**EXECUTIVE/PRINCIPAL NURSE ADMIN.									
*HOSPITAL INPATIENT									
*LONG TERM HOSPITALS									
PSYCHIATRIC(125)	366	5.00	95.00	0.00	0.00	18	347	0	0
ALL OTHER LONG TERM(126)	393	5.00	95.00	0.00	0.00	19	373	0	0
*SHORT TERM HOSPITALS									
SMALL(127)	3663	5.00	95.00	0.00	0.00	183	3479	0	0
LARGE,TEACHING(128)	1716	5.00	95.00	0.00	0.00	85	1630	0	0
ALL OTHER SHORT TERM(129)	5672	5.00	95.00	0.00	0.00	283	5388	0	0
*HOSPITAL OUTPATIENT(130)	0	5.00	95.00	0.00	0.00	0	0	0	0
*NURSING HOMES									
NURSING CARE HOMES(131)	11546	5.00	95.00	0.00	0.00	577	10968	0	0
PERSONAL CARE HOMES W/NSNG(132)	1102	5.00	95.00	0.00	0.00	55	1046	0	0
*COMMUNITY HEALTH(133)	4780	5.00	95.00	0.00	0.00	239	4541	0	0
**TOTAL EXEC/PRIN ADMIN---------------	29238					1459	27772	0	0
**MID-LEVEL NURSE ADMIN./MANAGERS									
*HOSPITAL INPATIENT									
*LONG TERM HOSPITALS									
PSYCHIATRIC(134)	5908	0.00	25.00	75.00	0.00	0	1477	4431	0
ALL OTHER LONG TERM(135)	7573	0.00	25.00	75.00	0.00	0	1893	5679	0
*SHORT TERM HOSPITALS									
SMALL(136)	6924	0.00	25.00	75.00	0.00	0	1731	5193	0
LARGE,TEACHING(137)	47074	0.00	25.00	75.00	0.00	0	11768	35305	0
ALL OTHER SHORT TERM(138)	52023	0.00	25.00	75.00	0.00	0	13005	39017	0
*HOSPITAL OUTPATIENT(139)	6471	0.00	25.00	75.00	0.00	0	1617	4853	0
*NURSING HOMES									
NURSING CARE HOMES(140)	18922	0.00	25.00	75.00	0.00	0	4730	14191	0
PERSONAL CARE HOMES W/NSNG(141)	259	0.00	25.00	75.00	0.00	0	64	194	0
*COMMUNITY HEALTH(142)	21216	0.00	25.00	75.00	0.00	0	5304	15912	0
**TOTAL MID-LEVEL ADMIN---------------	166370					0	41589	124775	0
***TOTAL RNS IN ADMINISTRATIVE POSITIONS---------------------------	195608					1459	69361	124775	0

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PART 2
ANALYSIS AND PLANNING FOR IMPROVED DISTRIBUTION OF NURSING PERSONNEL AND SERVICES

PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATES - IN-SERVICE INSTRUCTORS,RESEARCHERS,AND CONSULTANTS	1975 NO.OF INSTITUTIONS	1982 NO.OF INSTITUTIONS	1982 INSTRUCTORS/ INSTITUTION	1982 TOTAL FTE INSTRUCTORS
**IN-SERVICE INSTRUCTORS				
*SHORT TERM,LARGE TEACHING HOSPITALS(143)	526	572	6.00	3432
*ALL OTHER HOSPITALS AND NURSING CARE HOMES(144)	23525	26244	1.00	26244
*COMMUNITY HEALTH(145)	4325(1972)	4780	1.00	4780

	1982 FTE DCC RN	1982 RES. CONSLT./ 10 DCC RN	1982 TOTAL FTE RES.+CONSLT
**RESEARCHERS AND CONSULTANTS (BASED ON DCC RN)(146)	1326009	0.30	39780
**TOTAL IN-SERVICE INSTRUCTORS, RESEARCHERS AND CONSULTANTS------------------			74236

	1982 TOTAL FTE RN	PERCENT DOCT.	PERCENT MAST.	PERCENT BACC.	PERCENT AD/DIP	NUMBER DOCT.	NUMBER MAST.	NUMBER BACC.	NUMBER AD/DIP
**IN-SERVICE INSTRUCTORS									
*SHORT TERM,LARGE TEACHING HOSPITALS(147)	3432	0.00	100.00	0.00	0.00	0	3432	0	0
*ALL OTHER HOSPITALS AND NURSING CARE HOMES(148)	26244	0.00	100.00	0.00	0.00	0	26244	0	0
*COMMUNITY HEALTH(149)	4780	0.00	100.00	0.00	0.00	0	4780	0	0
**RESEARCHERS AND CONSULTANTS(150)	39780	50.00	50.00	0.00	0.00	19890	19890	0	0
***TOTAL IN-SERVICE INSTRUCTORS, RESEARCHERS,AND CONSULTANTS-----------	74236					19890	54346	0	0

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ANALYSIS AND PLANNING FOR IMPROVED DISTRIBUTION OF NURSING PERSONNEL AND SERVICES

PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATES - RNS IN SCHOOLS OF NURSING	1973	1982		
	NO.OF STUDENTS	NO.OF STUDENTS	FACULTY/ 10 STUDENTS	TOTAL FTE FACULTY
**FACULTY				
DOCTORAL PROGRAM(151)	375	880	2.50	220
MASTERS PROGRAM(152)	6714	8020	2.50	2005
BACCALAUREATE PROGRAM(153)	85156	132100	1.67	22060
ASSOCIATE PROGRAM(154)	78673	75200	1.25	9400
DIPLOMA PROGRAM(155)	68760	39400	1.25	4925
LPN/LVN PROGRAM(156)	56267	58850	1.25	7356
TOTAL FACULTY-------------------------				45966

	1973	1982				
	NO.OF PROGRAMS	NO.OF PROGRAMS	FTE FACULTY	ADMINISTRATORS/ PROGRAM	ADMIN/ 10 FACULTY	TOTAL FTE ADMIN
**SCHOOL ADMINISTRATORS						
DOCTORAL PROGRAM(157)	8	19	220	1.00	0.00	19
MASTERS PROGRAM(158)	87	104	2005	1.00	0.00	104
BACCALAUREATE PROGRAM(159)	302	470	22060	3.00	0.00	1410
ASSOCIATE PROGRAM(160)	565	540	9400	1.00	0.00	540
DIPLOMA PROGRAM(161)	493	280	4925	1.00	0.00	280
LPN/LVN PROGRAM(162)	1283	1340	7356	1.00	0.00	1340
TOTAL SCHOOL ADMINISTRATORS-----------						3693

***TOTAL RNS IN SCHOOLS OF NURSING---------------------------	49659

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATES EDUCATIONAL PREPARATION OF RNS IN SCHOOLS OF NURSING	1982 TOTAL FTE RN	PERCENT DOCT.	 MAST.	 BACC.	 AD/DIP	NUMBER DOCT.	 MAST.	 BACC.	 AD/DIP
**FACULTY									
DOCTORAL PROGRAM(163)	220	100.00	0.00	0.00	0.00	220	0	0	0
MASTERS PROGRAM(164)	2005	75.00	25.00	0.00	0.00	1503	501	0	0
BACCALAUREATE PROGRAM(165)	22060	20.00	80.00	0.00	0.00	4412	17648	0	0
ASSOCIATE PROGRAM(166)	9400	10.00	90.00	0.00	0.00	940	8460	0	0
DIPLOMA PROGRAM(167)	4925	10.00	90.00	0.00	0.00	492	4432	0	0
LPN/LVN PROGRAM(168)	7356	0.00	60.00	40.00	0.00	0	4413	2942	0
**TOTAL FACULTY----------------------	45966					7567	35454	2942	0
**SCHOOL ADMINISTRATORS									
DOCTORAL PROGRAM(169)	19	100.00	0.00	0.00	0.00	19	0	0	0
MASTERS PROGRAM(170)	104	100.00	0.00	0.00	0.00	104	0	0	0
BACCALAUREATE PROGRAM(171)	1410	100.00	0.00	0.00	0.00	1410	0	0	0
ASSOCIATE PROGRAM(172)	540	25.00	75.00	0.00	0.00	135	405	0	0
DIPLOMA PROGRAM(173)	280	25.00	75.00	0.00	0.00	70	210	0	0
LPN/LVN PROGRAM(174)	1340	0.00	100.00	0.00	0.00	0	1340	0	0
**TOTAL SCHOOL ADMINISTRATORS---------	3693					1738	1955	0	0
***TOTAL RNS IN SCHOOLS OF NURSING---------------------------	49659					9305	37409	2942	0

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PANEL OF EXPERT CONSULTANTS - UPPER BOUND

***ESTIMATES - PRIVATE DUTY AND RNS IN HEALTH RELATED ORGANIZATIONS	1982 RN/10K POPULATION	1982 TOTAL FTE RN
**PRIVATE DUTY(175)	0.90	20230
**HEALTH-RELATED ORGANIZATIONS(176)	0.50	11239

	1982								
	TOTAL FTE RN	PERCENT DOCT.	PERCENT MAST.	PERCENT BACC.	PERCENT AD/DIP	NUMBER DOCT.	NUMBER MAST.	NUMBER BACC.	NUMBER AD/DIP
PRIVATE DUTY(177)	20230	0.00	0.00	20.00	80.00	0	0	4046	16184
HEALTH-RELATED ORGANIZATIONS(178)	11239	10.00	90.00	0.00	0.00	1123	10115	0	0

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ANALYSIS AND PLANNING FOR IMPROVED DISTRIBUTION OF NURSING PERSONNEL AND SERVICES

PANEL OF EXPERT CONSULTANTS - UPPER BOUND

******SUMMARY*******
PROJECTION OF NURSING REQUIREMENTS, 1982

	TOTAL FTE RN	------RN BY EDUCATION LEVEL-----[2] DOCT.	MAST.	BACC.	AD/DIP	TOTAL LPN	TOTAL AIDE
***DIRECT CLIENT CARE							
HOSPITALS	862690	0	60839	383809	418031	205449	236390
NURSING HOMES	194414	0	9303	92555	92555	370222	380018
PHYSICIANS OFFICES	56738	0	14184	14184	28369	11347	
COMMUNITY HEALTH	212167	0	30305	172426	9430	7515	12573
TOTAL------------------------------	1326009	0	114631	662974	548385	594533	628981
***ADMINISTRATORS							
EXECUTIVE/PRINCIPAL NURSE ADMIN.	29238	1459	27772	0	0		
MID-LEVEL NURSE ADMIN./MANAGERS	166370	0	41589	124775	0		
TOTAL------------------------------	195608	1459	69361	124775	0		
***IN-SERVICE INSTRUCTORS	34456	0	34456	0	0		
***RESEARCHERS AND CONSULTANTS	39780	19890	19890	0	0		
***SCHOOLS OF NURSING							
FACULTY	45966	7567	35454	2942	0		
SCHOOL ADMINISTRATORS	3693	1738	1955	0	0		
TOTAL------------------------------	49659	9305	37409	2942	0		
***PRIVATE DUTY	20230	0	0	4046	16184		
***HEALTH-RELATED ORGANIZATIONS	11239	1123	10115	0	0		
*****GRAND TOTAL------------------------	1676981	31777	285862	794737	564569	594533	628981

THE TOTAL NUMBER OF NURSES WITHIN THE DIRECT CLIENT CARE CATEGORY INCLUDES 77770 CLINICAL SPECIALISTS. 57132 OF THE DIRECT CLIENT CARE NURSES PROJECTED ARE TO HAVE PRACTITIONER PREPARATION AND SKILLS.

DEVELOPED BY THE WESTERN INTERSTATE COMMISSION FOR HIGHER EDUCATION
AND THE NATIONAL CENTER FOR HIGHER EDUCATION MANAGEMENT SYSTEMS

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[2] The number of RNs by educational preparation may not equal the total number of FTE RNs due to the calculation proceedure.

Appendix C
Sources of Data

Appendix C
Sources of Data

The Panel of Expert Consultants had access to all the data amassed in the course of the Analysis and Planning for Improved Distribution of Nursing Personnel and Services project. This data base contains more than one billion characters of data and was processed in a multitude of ways to produce profile reports for the Panel's deliberations. The data sources used in developing background reports included:

- American Nurses' Association
  - Inventory of Registered Nurses
  - Inventory of Licensed Practical/Vocational Nurses
- National League for Nursing
  - Annual Survey of Schools of Nursing
  - Nurse Faculty Census
  - Special Surveys of Schools of Nursing - Men and Minority Students, Experienced Students
  - Nurse Career Pattern Study
- Division of Nursing/Public Health Service/DHEW
  - Employment Opportunity Study for Newly Licensed Nurses
  - Preliminary Projections of Enrollments in Schools of Nursing
- Bureau of Labor Statistics
  - Industry Wage Survey, Earnings and Supplementary Benefits in Hospitals
- Bureau of the Census
  - Fourth Count, 1970 Decennial Census
  - Series II Population Projections to 1980
- National Center for Health Statistics
  - Master Facility Inventory - Nursing Homes and Other Health Facilities
  - Health Interview survey
  - Natality Statistics
  - Mortality Statistics
  - Monthly Vital Statistics Report
- American Medical Association
  - Annual Survey of Physicians
- American Hospital Association
  - Nursing Pesonnel Survey
  - Annual Survey of Hospitals

Data for the Requirements Projections were obtained from the following sources:

- Vector Research, Incorporated
  - Populations Projections, 1972-1985
- Bureau of the Census
  - 1970 Decennial Census of Population and housing
  - Published Data from 1970 County Business Patterns
- American Hospital Association
  - 1975 Annual Survey of Hospitals
- National Center for Health Statistics
  - 1973 Master Facility Inventory of Nursing Homes and Other Health Facilities
- Division of Nursing, PHS
  - 1972 Survey of Public Health Nursing
- National League for Nursing
  - 1972 Annual Survey of Schools of Nursing—Registered and Practical
- American Medical Association
  - Published Data from 1973 Physician Master File
- National Center for Educational Statistics
  - Published Data from 1970 Digest of Educational Statistics

National Requirements Projections

Certain projection methods and estimates were incorporated in the Panel's estimate of 1982 requirements. The following notes are keyed to line numbers found in Appendix B.

Lines 2-4: Population projections by cohort were developed by Vector Research, Inc. Basically, these numbers are based upon the Census Bureau's Series II projections. Interstate migration patterns for the long term (1950-1970) and short term (1970-1974) were averaged for the civilian population. Military population is assumed to remain constant. Time-series testing has upheld the validity of this approach.

Lines 5-6: Births are taken from Series II projections; infant mortality reflects the current mortality rate.

Lines 7-28: The trend in most hospital bed-to-population ratios has been steadily upward. The Panel was presented with data demonstrating this increase for the years 1968-1975. However, the Panel projected that the future requirements for hospital inpatient beds should not increase, except to reflect the increase in population (i.e., the bed/population ratio should stabilize). Further, the Panel foresaw no requirement for major change in occupancy rates. The net effect of this projection is to fix the level of the daily census-to-population ratio. Justification of these projected requirements (e.g., preventive orientation, cost containment, legislation, etc.) is presented in the narrative portion of the Panel's Final Report. Note that occupancy rates are not available for individual types of beds; a simple sensitivity analysis shows that within reasonable limits, using an overall occupancy rate does not affect the total projected requirements by more than 1 percent.

Lines 29-31: Hospital ambulatory services reflect a growth consistent with the 1971 to 1975 trends. Note that line 31 deals strictly with the number of visits to organized outpatient clinics within hospitals.

Lines 32-33: Nursing care homes are those facilities in which 50 percent or more of the residents received nursing care during the week before the Master Facilities Inventory (MFI) was administered, and with an RN or

LPN employed at least 35 hours per week. Nursing care is defined as the provision of one or more of the following services: taking temperature-pulse-respiration or blood pressure; full bed bath; application of dressings or bandages; catheterization; intravenous, intramuscular, or hypodermic injection; nasal feeding; bowel and bladder retraining; oxygen therapy; and enema.

The *personal care home with nursing* is a facility in which (a) some but less than 50 percent of the residents received nursing care during the week before the survey and there was at least one full-time RN or LPN; or (b) some of the residents received nursing care during the week before the survey and no RN or LPN was employed, and the institution either provided administration of medicines (including supervision over self-administered medicines) or provided assistance with three or more activities of daily living. These activities include rub or massage service, or assistance with bathing, dressing, correspondence, shopping, walking or getting about, and eating.

Line 34: The growth in the number of office-based physicians is consistent with the 1970-1973 pattern.

Lines 35-40: The community health area is addressed in Appendix D.

Lines 106-114: Projections of the increase in the number of institutions conform with the cumulative effects of increasing population and changes in the service-to-population ratios projected in lines 7-33. The small increase in the number of community health agencies is consistent with 1970-1972 patterns.

Lines 148-159: The projected number of students and programs corresponds closely with the most recent extrapolations made by the Division of Nursing. Since the Panel did not address the problem of estimating future nurse supply, these values do not reflect the number of students (or programs) necessary to meet the projected requirements.

State Requirements Projections

The Panel's projection criteria were applied to each state in order to produce Table VI.8, RNs, LPNs, Aides by States. Increases and decreases in service-to-population ratios were translated into annual percentage changes; these changes were then applied to each state's data. For example, the national projections for emergency visits reflect a 1 percent per year increase in the visit/population ratio. Each state, individually, was therefore projected to have a 1 percent annual increase in this ratio. Justification for this approach is presented in the narrative portion of this document.

A few exceptions to this procedure occurred. These are documented below.

Lines 2-4: Interstate migration patterns were established. Refer to the above discussion of National Requirements Projections.

Lines 5-6: Births were projected in accordance with 1974 fertility rates and the anticipated number of females of child-bearing age. Infant deaths were calculated on the basis of 1974 state mortality statistics.

Lines 10, 18, 25: Self-care units in all states were projected to phase out completely by 1982.

Lines 7-33: No major change in occupancy rates were projected by the Panel. Thus, each state's 1975 occupancy rates were used.

Lines 35-40: The method for calculating community health nursing requirements is presented in detail in Appendix D.

Note that this projection method will never increase a zero value. For example, a state with no doctoral students in 1973 will show none in 1982. This should be viewed as an idiosyncracy of the projection methodology, due to the lack of detailed information about each individual state.

Projected national requirements need not necessarily match the sum of the projected requirements of the states, owing to problems encountered in rounding off numbers.

Appendix D

Assumptions, Rationale, Estimates, and Calculations for Community Health Nursing Requirements

Part 1 - Formulas for PHN Staffing Requirements
to Meet Community Health Needs
Part 2 - PHN Requirements Calculations

Appendix D
Part 1

Formulas for PHN Staffing Requirements to Meet Community Health Needs*
(Exclusive of Physician's Office or Institutional Based Clinic Services)

Public Health Nursing Service	Staffing Requirements	Rationale/Comments	Documented Population Need for PHN Service
I. Home Visits A. Home Health Care	5% of number of hospital discharges × 11 visits/person/year × $\frac{\text{upper bound}}{4}$ or $\frac{\text{lower bound}}{6}$ visits/RN/day adjusted FTE plus	11 visits were accepted as average number per patient/case 4-6 visits are upper and lower bounds to reflect increase care provided with fewer visits and to allow for travel time	4-10% of hospital discharges need home health care with 2-5% of these needing skilled nursing care[1]
	3% of total population over age 65 × 11 visits/person/year × $\frac{\text{upper bound}}{4}$ or $\frac{\text{lower bound}}{6}$ visits/RN/day adjusted FTE	See Reference 1	"Potential pool of 33 million people in U.S. (18 million between 18-64 years, 15 million elderly) who may at one time or another require such (home) supportive services."[2]
	Lower bound staffing mix: 10 RNs/2 LPNs/2.5 aides Upper bound staffing mix: 10 RNs/1.4 LPNs/2 aides		"National Health Survey Interview of 1965 to 1967 found that 85.6% of persons over 65 and living at home had one or more chronic conditions; 46% of these had varying degrees of limitation of major activity (ability to work, keep house, etc.). In addition 18.7% had limitation of mobility, 7.7% had trouble getting around, 4.8% were confined to the house. Limitation of major activity has been used as a basis for estimating need for home-help services by Sproat (1971) in a preparatory paper for the Morris (1971) report on *Alternatives to Nursing Home Care: A Proposal.* By this method 13.8% of the presently non-institutionalized elderly have need for this type of home service."[3] "14% of older adults who live at home are bedfast, housebound, or limited in activities."[4]

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*Based on PHN staff efforts obtained by Gertrude Hotaling and Claudia Lukasik and excerpted from materials prepared for the Panel of Expert Consultants.

[1] *Report on PHN Staffing Efforts and Appendices* submitted to the Western Interstate Commission for Higher Education, Panel of Expert Consultants, by G. Hotaling and C. Lukasik (April 26, 1977).

[2] Special Committee on Aging, U.S. Senate, *Alternatives to Nursing Home Care: A Proposal.* Washington, D.C.: U.S. Government Printing Office, 1971, p. 2 (Morris Report).

[3] Preparatory Paper by Sproat (1971) for the Morris Report (1971) on "Alternatives to Nursing Home Care: A Proposal," cited in reference number 2 above.

[4] Shinas, Ethel. *Old People in Three Industrial Societies,* 1968.

B. General Home Visits or General Public Health	4 visits/person/year $\frac{\text{upper bound}}{5}$ or $\frac{\text{lower bound}}{7}$ visits/RN/day ×	4 visits were accepted as average number per patient/case 5-7 visits are upper and lower bounds to reflect increased care provided with fewer visits and to allow for travel time See Reference 1	"It can be estimated on basis of ***unpublished*** data from 1974 Health Interview Survey that some *3.1* million persons or roughly *1.5%* of the civilian non-institutional population received home care from a physician in 1973. However, between 1966-68, more than 1.7 million persons or 4.9% of the civilian non-institutionalized population aged 55 years and over received health related home care annually."[3] "Half of the entire population suffer from one or more chronic illnesses, and such illnesses are highly associated with advanced age and low income."[4]
	each high-risk group finding:	For this proposal, only aggregate poplations at high risk were chosen for PHN home visiting - due to considerations of cost, resource supply, and availability of other complementary services for other than at high-risk groups	
	1. Maternal Child Health	Because of U.S. status in infant mortality, concentration on MCH high-risk group is given. There has been previous correlation between efforts of PHN and improvement of pregnancy outcomes. Also coincides with National HSA Priorities Subgoal 1-A	"Infant mortality in 1975 was 16.1—U.S. ranks 15th internationally. 70% of deaths occur in first month of life (in 1975) and are higher for black babies who are more likely to be born to teenagers and unmarried mothers and whose incomes are low and who are less likely to receive early prenatal care."[5]
	Number of mothers without prenatal care	Infant mortality is 3-4 times as high in babies born to mothers without prenatal care. *Early* PHN intervention on post-discharge will increase prevention, case finding of problems, and health supervision.	"9% of all births in 1974 were with no prenatal care."[6] See Reference 8

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[3] *The Nation's Use of Health Resources*, 1976 Edition. U.S. Department of Health, Education, and Welfare, Public Health Service (DHEW Publication No. (HRA) 77-1240), Washington, D.C.: Government Printing Office, p. 90.

Original Reference: National Center for Health Statistics: Home Care for Persons 55 Years and Over, U.S., June 1966 - June 1968. *Vital and Health Statistics*, Series 10 - No. 73 (DHEW Publication No. (HSM) 72-1062). Health Services and Mental Health Administration, Washington, D.C.: Government Printing Office, July 1972, p. 4.

[4] National Center for Health statistics, Vital and Health Statistics. Washington, D.C.: Government Printing Office, U.S. Public Health Service Publication 1000, Series 10.

[5] Statement by Mrs. Dorothy P. Rice, Director, National Center for Health Statistics, before the Senate Health Subcommittee Health and Scientific Research Committee on Human Resources, U.S. Senate, Thursday, March 31, 1977.

[6] *Forward Plan for Health*, 1978-82. U.S. Department of Health, Education, and Welfare, Public Health Service (DHEW Publication No. (OS) 76-50046), Washington, D.C.: Government Printing Office, August, 1976, pp. 13-15.

2. Number of Infant Deaths 1 month - 1 year	PHN would assist in grieving process as well as investigative purposes for case finding, and prevention; also could provide health supervision of other family members	Sudden Infant Death Syndrome (SIDS) accounts for 60% of all infant deaths 1 month to 1 year of life (National Foundation - SIDS)
3. 10% of births: 5% to high-risk mothers 5% other infant follow-up	About 8-10% of all mothers are identified at risk prenatally; babies in this group and 5% of all others will need PHN home intervention for prevention and health promotion, premie follow-up, congenital malformations, etc.	Reference 8, pp. 15 and 73
4. 5% other childhood morbidity	Includes children with problems in behavior, acute and chronic illness, as well as handicapped	Reference 8, p. 73 "SES - a measure of income, education and occupation of parents empirically found a strong association with many aspects of health, and health care behavior and children development. Most such relations show adverse outcomes for children living in low SES."[9], p. 31. "Frequency of major acute types of illnesses in children under 15 years are 55% respiratory (0-4 years greatest) and 19.5% infective and parasitic; plus child abuse, lead poisoning, chronic illness and handicapping conditions." See Reference 9, p. 43
5. Communicable Disease a. Active TB b. Hepatitis	Home visiting to all active TB and hepatitis is on the increase; expect some home visiting essential	Reference 7, p. 4, and also National Center for Disease Control
6. Chronic Illness a. 2½% of population 17 years and older for general chronic illness (hypertension, diabetes, obesity, etc.)	Follow-up for health maintenance; prevention and/or case finding of other family members	One-half of U.S. population has chronic illnesses. See Reference 6 under HMc, and Reference 8, p. 14
b. 2½% of population 17 years and older with mental health-related illness, drug abuse, alcohol	As above, with more concentration to teen populations regarding alcoholism and suicides	See Reference 8, pp. 14, 74, 80, and 81; Reference 10, pp. 4, 8, and 77, *Chicago Tribune* and Reference 11, pp. 4, 19, and 77, *Chicago Tribune*

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[9] A Report of the Council on Pediatric Practice of the AA of Pediatrics on the *Delivery of Health Care to Children, 1970, AAP 1971 U.S.A., p. 31.*

[10] An article from the *Chicago Tribune*, dated 4-8-77.

[11] An article from the *Chicago Tribune*, dated 4-19-77.

	7. Environmental 1. One half of 1% total population	Population faced with unhealthy living conditions, or without any health care system and in need of same.	
II. Clinic Visits	Ideal 3 visits/hour/RN 8 hour day with attempt to estimate current number of clinic visits, or 20,000 FTE to 30,000 FTE	All types of ambulatory visits - expect to see differences in numbers of visits per primary care provider or nurse practitioner vs. general provider. This is double (9,027) the FTE count in 1972, *(Public Health Nursing)*, but still seems low. Ambulatory care visits have increased dramatically.	
	Lower and upper limits of staffing mix: 10RNs/1LPN/2 aides		
III. Occupational Health	1 RN per 500 employees		"The minimum block of nursing time in a plant at one time should be 2 hours for any plant of more than about 35 workers. The maximum and frequency will depend upon the plant need, the interest of management, and the medical service available. "A ratio of 1 hour of physician time to 3 hours of nurse time has worked out satisfactorily in some plants and has been the goal toward which others are working. The nurse should be in the plant when the doctor is there. A ratio of 3 hours of doctor's time to 9 hours of nurse's time per 100 workers is desirable and necessary when comprehensive preplacement and periodic physical examinations are done. "The number of nurses employed should depend on the type of industry and the number of workers. For the maintenance of complete health service in an industry it was recommended that there be 1 nurse for up to 300 employees, 2 or more nurses for up to 600 employees, and 3 or more nurses up to 1,000 employees, 1 nurse for each additional 1,000 employees up to 5,000 and 1 nurse per each additional 2,000 employees. Additional nurses may be

			required because of hazards present in a particular plant and to supply service for second and third shifts. This number will be reduced in inverse ratio to the number of technical and nonprofessional workers employed in the medical department. Smaller industries (those employing less than 500 workers) which do not have serious occupational hazards may find part-time nursing services adequate.''[12]
IV. School Health	1 RN/750-1500 Students	The National Education Association recommends a ratio of 1 RN/1000 school-age population	
V. Other Licensure and Regulation		Only a function of official agencies; difficult to assess need	

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[12] American Public Health Association, Committee to Study the Duties of Nurses in Industry: "Duties of Nurses in Industry." *American Journal of Public Health*, 33:876 (July), 1943.

Appendix D
Part 2

PHN Requirements Calculations

Method

Five basic functions of Public Health Nursing have been identified to the Panel:

- I. Home Visiting
  - A. Home Health Care
  - B. General Home Visits
- II. Clinic Visits
- III. Occupational Health
- IV. School Health
- V. Other (Licensure, Regulation, etc.).

Specific staffing requirements within each of these areas have been established, based upon documented needs of certain population cohorts.

With the assistance of Timothy Doyle and Vector Research Incorporated, estimates of the size of the following groups have been developed:

- Persons under age 17
- Persons age 17 to 64
- Persons age 65 and over
- Live births
- Infant deaths (1 month to 1 year of age).

These estimates are based upon the Census Bureau's Series II population projections, current fertility distributions, and current infant mortality rates. The estimates are available for the years 1972-1985.

In general, the Panel's staffing criteria are translated into RN/population ratios for 1974 (the most recent uniformly valid data point). These ratios are then applied to the projected size of the associated population cohort. Wherever possible, the calculations are performed on state-specific data.

Each basic function of public health nursing will now be examined. Calculations for national RN/population ratios are documented, and any data limitations are explained. For complete documentation of the rationale behind these calculations, refer to Appendix D, Part 1.

I. Home Visiting

A. Home Health Care

Basis: hospital discharge follow-up, and an alternative to nursing home care
Staffing: 11 visits/client/year
4 to 6 visits/RN/day

1. 1974 hospital discharges	35,860,000	
% requiring follow-up	× 5%	
total number of clients	1,793,000	
	Minimum	Maximum
visits/client/year	× 11	× 11
visits/RN/day	÷ 6	÷ 4
RN working days/year	÷ 240	240
total FTE RN	13,697	20,544
total population, 1974	209,418,000	209,518,000
RN/10,000 population	0.65	0.98

2. 1974 number of persons 65 and over	21,824,000
% requiring home service	× 3%
total number of clients	654,720

	Minimum	Maximum
visits/client/year	× 11	× 11
visits/RN/day	÷ 6	÷ 4
RN working days/year	÷ 240	÷ 240
total FTE RN	5,001	7,502
1974 population over 64	21,824,000	21,824,000
RN/10,000 over 64	2.29	3.44

TOTAL

Cohort	RN/10,000 in cohort	
	Minimum	Maximum
total population	0.65	0.98
over 64 years	2.29	3.44

B. General Home Visits

Basis: persons in identifiable high-risk groups
Staffing: 4 visits/client/year
5 to 7 visits/RN/day

1.

1974 number of births	3,160,000
% without prenatal care	× 9%
total number of clients	284,400

	Minimum	Maximum
visits/client	× 4	× 4
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
Total FTE RN	677	948
1974 number of births	3,160,000	3,160,000
RN/10,000 births	2.14	3.00

2.

1974 number of infant deaths (1 month to 1 year)	52,300

	Minimum	Maximum
visits/client	× 4	× 4
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
total FTE RN	125	175
1974 number of infant deaths	52,300	52,300
RN/10,000 infant deaths	23.90	33.27

3.

1974 number of births	3,160,000
% high risk and other follow-up	× 10%
total number of clients	316,000

	Minimum	Maximum
visits/client	× 4	× 4
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
total FTE RN	752	1,053

1974 number of births	3,160,000	3,160,000
RN/10,000 births	2.38	3.33

4. 1974 number of persons under 17	63,117,000	
% with other morbidity	× 5%	
total number of clients	3,155,850	

	Minimum	Maximum
visits/client	× 4	× 4
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
total FTE RN	7,514	10,520
1974 persons under 17	63,117,000	63,117,000
RN/10,000 under 17	1.19	1.67

5. 1974 total population	209,518,000	
% with active TB and hepatitis	× 0.3%	
total number of clients	628,554	

	Minimum	Maximum
visits/client	× 4	× 4
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
total FTE RN	1,497	2,095
1974 total population	209,518,000	209,518,000
RN/10,000 population	0.07	0.10

6. 1974 population 17 and older	146,401,000	
% with chronic illness	× 5%	
total number of clients	7,320,050	

	Minimum	Maximum
visits/client	× 4	× 4
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
total FTE RN	17,428	24,400
1974 population over 16	146,401,000	146,401,000
RN/10,000 over 16	1.19	1.67

7. 1974 total population	209,518,000	
% environmental visits	× 0.5%	
total number of clients	1,047,590	

	Minimum	Maximum
visits/client	× 1	× 1
visits/RN/day	÷ 7	÷ 5
RN working days/year	÷ 240	÷ 240
total FTE RN	624	873
1974 total population	209,518,000	209,518,000
RN/10,000 population	0.03	0.04

TOTAL

Cohort	RN/10,000 in cohort	
	Minimum	Maximum
live births	4.52	6.33
infant deaths	23.90	33.27
under 17 years	1.29	1.81
over 17 years	1.29	1.81

II. Clinic Visits

Basis: population requiring such services; due to lack of uniform data, only a total national estimate is possible

	Minimum	Maximum
estimated FTE required, 1974	20,000	30,000
1974 total population	209,518,000	209,518,000
RN/total population	0.95	1.43

TOTAL

Cohort	RN/10,000 in cohort	
	Minimum	Maximum
total population	0.95	1.43

Note: ratios cannot be calculated for each state individually

III. Occupational Health

Basis: non-government employees working for large firms (those with 500 or more employees)
Staffing: 1 FTE RN per 500 employees

1974 employees in large firms	15,429,000	
	Minimum	Maximum
FTE RN per 500 employees	1	1
total FTE RN	30,858	30,858
1974 population, age 17-64	124,577,000	124,577,000
RN/10,000 population, 17-64	2.48	2.48

TOTAL

Cohort	RN/10,000 in cohort	
	Minimum	Maximum
population age 17-64	2.48	2.48

IV. School Health

Basis: children in school
Staffing: 1 RN for each 750-1,500 students

1974 number of students grades 1-12	48,756,000

	Minimum	Maximum
FTE RN per 1,000 students	0.67	1.33
total FTE RN	32,504	65,008
1974 population under 17	63,117,000	63,117,000
RN/10,000 population under 17	5.14	10.28

TOTAL

Cohort	RN/10,000 in cohort	
	Minimum	Maximum
population under 17	5.14	10.28

V. Other (Licensure, Regulation, etc.)

Basis: a function of official agencies; data not available

TOTAL

Cohort	RN/10,000 in cohort	
	Minimum	Maximum
total population	0.0	0.0

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Chapter VI.6

Addendum to the Panel's Report:

Comparison of 1982 Requirements and Resources of FTE Registered Nurses and Licensed Practical Nurses

Background

The requirements for FTE registered nurses, licensed practical nurses, and aides were calculated based on the Panel of Expert Consultants' decisions on the assumptions, estimates, and criteria for the key variables in the State Model. The decisions were applied to national and state-specific data to project requirements for RNs by total and by educational preparation, for LPNs, and for aides at national and state-by-state levels. The Panel made its projections for RNs by four distinct educational levels:

1. Associate degree/diploma
2. Baccalaureate
3. Master's
4. Doctoral

The requirements for the nation are listed in Table VI.4 of the panel's report. The results for each of the 50 states plus the District of Columbia are listed in Table VI.8, Parts I and II of that report.

Subsequent to the panel's report, the Division of Nursing, DHEW, estimated resources for the RNs and LPNs. The methodology used to estimate the resources is described in the 1978 Report to Congress (to be released in 1979). The resource calculation separates the educational preparation of RNs into two groups:

1. Associate degree/diploma
2. Baccalaureate and above

The Division of Nursing made estimates based on both Series I and Series II population projections. For this report, the Series I projections were used. The national supply figures for RNs for Series I are less than 1 percent below the Series II figures and for LPNs are less than 1 percent above the Series II figures.

Methodology

The requirements for FTE RNs and LPNs were compared with the resources for 1982. All numbers are in full-time equivalents. The numerical difference between requirements and resources was calculated. Whenever the resources were less than the requirements, a minus sign appears. The percentage difference was calculated by dividing the numerical difference by the requirements. The positive percentage reflects the percentage that the resources will be above the requirements, and the negative percentage difference reflects the percentage that the resources will fall below the requirements.

A rank ordering of the percentage differences for the 50 states plus the District of Columbia was performed. The highest percentage of resources to requirements was ranked as 1, the lowest as 51.

Each of the 50 states, plus the District of Columbia, was also compared with the national percentage difference.

Limitations

It should be noted that the RN resources were not differentiated by higher degree (whether baccalaureate, master's, or doctorate). Therefore, surpluses or deficits within any of these three distinct educational levels cannot be determined.

As no projections for the supply of aides have been made, comparative data on resources and requirements for aides cannot be made.

Data on RNs

Table VI.9 lists the requirements and resources for FTE RNs for each state and for the nation. The numerical difference between requirements and resources and the percentage differences are listed. Table VI.9, Part I, shows the data using the lower bound criteria; Part II uses the upper bound criteria.

Table VI.10 is the ranking of the states by resources to requirements differences for total RNs and for RNs by educational preparation, associate degree/diplomas, and baccalaureate and higher degrees (1 is the highest in resources to requirements, 51 is the lowest). Those states for which the resources are equal to or greater than the requirements are listed above a dashed line (----). Those states for which the resources to requirements are equal to or better than the percentage difference for the nation are listed above double lines (═══). Part I of Table VI.10 shows the data using the lower bound criteria; Part II uses the upper bound criteria.

Summary of Data on RNs Applying Lower Bound Criteria

When the lower bound criteria (as developed by the panel) are applied, it is projected that the nation will have a deficit of 174,300 RNs, an oversupply of associate degree/diploma-prepared nurses of 331,700 and a deficit of RNs with baccalaureate and higher degrees of 505,900 by 1982.

Eighteen states will meet or exceed the total number of RNs required. These states will have a supply above the requirements ranging from 0 to 100 percent. The other 33 states (including the District of Columbia) will have a deficit ranging from 2 percent to 38 percent. All 50 states and the District of Columbia will exceed the requirements for associate degree/diploma nurses by a range of 40 to 230 percent. One state will exceed the baccalaureate and above requirement by 36 percent. The other 49 states (plus the District of Columbia) will have deficits ranging from 29 to 87 percent.

By 1982, only one state will exceed its requirements for RNs by total and by educational preparation.* (Because there is no breakout for baccalaureate, master's, and doctoral degrees, this state may have deficits in one or more of these levels.)

Comparisons of each of the states with the nation as a whole show that 37 states (including the District of Columbia) will be equal to or be better than the national percentage difference in total RNs (14 percent below required total RNs). Thirty-five states will be better than the associate degree/diploma national percentage (76 percent above required associate degree/diploma nurses). Thirty-one states will be equal to or be better than the national percentage difference for the baccalaureate and higher degree levels (65 percent below required baccalaureate and above RNs).

Summary of Data on RNs Applying Upper Bound Criteria

When the upper bound criteria developed by the national Panel of Expert Consultants are applied, it is projected that the nation will have a deficit of 632,000 RNs and an oversupply of associate degree/diploma nurses of 202,300, and a deficit of RNs with baccalaureate and higher degrees of 834,200 by 1982.

Three states will exceed the total number of RNs required by 2 to 48 percent. The other 48 states (including the District of Columbia) will have deficits ranging from 8 to 56 percent. All states will exceed the requirements for associate degree/diploma nurses by a range of 8 to 154 percent. No state will meet the requirements for RNs prepared at the baccalaureate and higher degree levels; the deficits will range from 6 to 91 percent. Therefore, no state will meet or exceed the upper bound criteria by 1982.

Comparisons of each state with the nation as a whole show that 37 states will be equal to or better than the national percentage difference for total RNs (38 percent below required total RNs); 35 will be equal to or better than the associate degree/diploma national percentage difference (36 percent over required associate degree/diploma-prepared nurses); and 28 states will be equal to or better than the baccalaureate and above national percentage difference (75 percent below required baccalaureate and higher degree RNs).

Data on LPNs

Table VI.11 lists the requirements and resources for FTE LPNs for each state and for the nation. The numerical difference between requirements and resources and the percentage differences are listed. Table VI.11, Part I, shows the data using the lower bound criteria; Part II uses the upper bound criteria.

Table VI.12 is the ranking of the states by resources to requirements differences for FTE LPNs (1 is the highest in resources to requirements, 51 is the lowest). Those states for which the resources are equal to or greater than the requirements are listed above a dashed line (- -). Those states for which the resources to requirements are equal to or better than the percentage difference for the nation are listed above double lines (═══). Part I of Table VI.12 shows the data using the lower bound criteria; Part II uses the upper bound criteria.

Summary of Data on LPNs Applying Lower Bound Criteria

When the lower bound criteria (as developed by the panel) are applied, it is projected that the nation will have a supply of LPNs 112,300 above the projected required number by 1982.

Thirty-eight states (including the District of Columbia) will have LPNs equal to or above the required number; these states will have a supply over requirements ranging from 0 to 165 percent. The other 13 states will have a deficit ranging from 1 to 35 percent.

Comparisons of each of the states with the nation as a whole show that 26 states will be better than the national percentage difference from LPNs (28 percent above required LPNs).

Summary of Data on LPNs Applying Upper Bound Criteria

When the upper bound criteria (as developed by the panel) are applied, it is projected that the nation will have a deficit of 76,500 LPNs.

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* This state will also exceed the number of LPNs required.

Nineteen states will have LPNs equal to or above the required numbers. These states will have a supply over requirements ranging from 0 to 89 percent. The other 32 states (including the District of Columbia) will have deficits ranging from 3 to 55 percent.

Comparisons of each of the states with the nation as a whole show that 27 states (including the District of Columbia) will be better than the national percentage difference for LPNs (12 percent below required LPNs).

Data on Total RNs and LPNs

Table VI.13 reflects the percentage difference for total RNs and LPNs for each state from Tables VI.9 and VI.11. (Where there is a positive percentage, the supply equals or exceeds requirements. Where there is a negative percentage, the supply is less than requirements.)

The table lists those states in which:

1. The supply of RNs and LPNs are equal to or better than the requirement
2. The supply of RNs is equal to or better than the requirements, but the LPN supply is lower than required
3. The supply of RNs is less than, required, but the LPN supply is equal to or better than required
4. The supply of RNs and LPNs is less than required.

Part I of Table VI.13 shows the results using lower bound criteria; Part II the upper bound criteria.

Summary of Data on RNs and LPNs Applying Lower Bound Criteria

When the lower bound criteria, developed by the panel are applied, it is projected that:

1. Eleven states will have a supply of RNs and LPNs equal to or better than the requirements
2. Seven states will have a supply of RNs equal to or better than requirements and will have a deficit of LPNs
3. Twenty-seven states (including the District of Columbia) will have deficit of RNs and a supply of LPNs equal to or better than the requirements
4. Six states will have deficits in RNs and LPNs.

Summary of Data on RNs and LPNs Applying Upper Bound Criteria

When the upper bound criteria, developed by the panel are applied, it is projected that:

1. Two states will have a supply of RNs and LPNs equal to or better than the requirements
2. One state will have a supply of RNs equal to or better than requirements and will have a deficit of LPNs
3. Seventeen states will have a deficit of RNs and a supply of LPNs equal to or better than requirements
4. Thirty-one states (including the District of Columbia) will have deficits in RNs and LPNs.

Table VI.9

Comparison of 1982 FTE RN Requirements and Resources for All States Plus the District of Columbia and for the Nation
Part I: Lower Bound Criteria

State	Requirements[1]			Resources[2]			Numerical difference[5]			Percentage Difference[5]		
	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total	AD/Dip.	Bacc & Above	Total	AD/Dip.	Bacc. & Above
ALABAMA	19100	6800	12300	13400	9800	3600	-5700	3000	-8700	-30	44	-71
ALASKA	1700	600	1100	3400	1900	1500	1700	1300	400	100	217	36
ARIZONA	11900	4200	7700	16500	11100	5400	4600	6900	-2300	39	164	-30
ARKANSAS	11800	4300	7600	7300	6300	1000	-4500	2000	-6600	-38	47	-87
CALIFORNIA	107900	38900	69000	80400	55400	25100	-27500	16500	-43900	-25	42	-64
COLORADO	14100	5100	9000	17100	10700	6400	3000	5600	-2600	21	110	-29
CONNECTICUT	17900	6300	11600	19500	14600	5000	1600	8300	-6600	9	132	-57
DELAWARE	3700	1300	2400	4500	3200	1300	800	1900	-1100	22	146	-46
DIST OF COLUMBIA	6900	2500	4300	6500	3800	2800	-400	1300	-1500	-6	52	-35
FLORIDA	47600	17800	29800	41500	35700	5700	-6100	17900	-24100	-13	101	-81
GEORGIA	25900	9200	16700	27200	21500	5700	1300	12300	-11000	5	134	-66
HAWAII	3800	1400	2400	4200	2900	1300	400	1500	-1100	11	107	-46
IDAHO	3800	1300	2400	3500	2900	600	-300	1600	-1800	-8	123	-75
ILLINOIS	63600	22600	41000	49200	34400	14800	-14400	11800	-26200	-23	52	-64
INDIANA	29200	10200	18900	20400	15300	5100	-8800	5100	-13800	-30	50	-73
IOWA	16600	5900	10800	14400	11500	2900	-2200	5600	-7900	-13	95	-73
KANSAS	13500	4800	8600	11700	8700	3000	-1800	3900	-5600	-13	81	-65
KENTUCKY	16800	5900	10900	13900	10600	3300	-2900	4700	-7600	-17	80	-70
LOUISIANA	19500	6900	12600	14900	10500	4400	-4600	3600	-8200	-24	52	-65
MAINE	5800	2000	3800	5500	4700	800	-300	2700	-3000	-5	135	-79
MARYLAND	22200	8000	14200	23100	16000	7100	900	8000	-7100	4	100	-50
MASSACHUSETTS	40500	14400	26100	45400	33200	12200	4900	18800	-13900	12	131	-53
MICHIGAN	47900	17000	31000	41300	31400	9900	-6600	14400	-21100	-14	85	-68
MINNESOTA	25500	9100	16400	23700	17300	6400	-1800	8200	-10000	-7	90	-61
MISSISSIPPI	11600	4100	7500	10000	7700	2400	-1600	3600	-5100	-14	88	-68
MISSOURI	28400	10100	18200	19500	14800	4700	-8900	4700	-13500	-31	47	-74
MONTANA	4700	1700	3000	3900	2800	1100	-800	1100	-1900	-17	65	-63
NEBRASKA	8900	3200	5800	9300	6700	2600	400	3500	-3200	4	109	-55
NEVADA	3600	1300	2300	4400	3500	900	800	2200	-1400	22	169	-61
NEW HAMPSHIRE	5600	2000	3600	5500	4500	1000	-100	2500	-2600	-2	125	-72
NEW JERSEY	38100	13700	24400	38700	29200	9500	600	15500	-14900	2	113	-61
NEW MEXICO	4800	1700	3100	4500	3500	1100	-300	1800	-2000	-6	106	-65

Table VI.9 (continued)

Part I: Lower Bound Criteria

State	Requirements[1]			Resources[2]			Numerical difference[5]			Percentage Difference[5]		
	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total	AD/Dip.	Bacc & Above	Total	AD/Dip.	Bacc. & Above
NEW YORK	113400	40300	73100	101900	70200	31700	-11500	29900	-41400	-10	74	-57
NORTH CAROLINA	27300	9600	17700	26700	20000	6700	-600	10400	-11000	-2	108	-62
NORTH DAKOTA	4100	1500	2600	2900	2100	800	-1200	600	-1800	-29	40	-69
OHIO	61200	21700	39600	60900	49300	11700	-300	27600	-27900	0	127	-70
OKLAHOMA	14500	5100	9400	11600	8900	2700	-2900	3800	-6700	-20	75	-71
OREGON	10600	3800	6800	12100	8600	3500	1500	4800	-3300	14	126	-49
PENNSYLVANIA	68900	24800	44100	72700	53400	19300	3800	28600	-24800	6	115	-56
RHODE ISLAND	5800	2100	3700	5200	3600	1600	-600	1500	-2100	-10	71	-57
SOUTH CAROLINA	13400	4700	8700	13100	10100	3000	-300	5400	-5700	-2	115	-66
SOUTH DAKOTA	4400	1500	2900	4200	3300	1000	-200	1800	-1900	-5	120	-66
TENNESSEE	23400	8300	15100	15900	12500	3400	-7500	4200	-11700	-32	51	-77
TEXAS	66800	23700	43100	51800	34100	17700	-15000	10400	-25400	-22	44	-59
UTAH	5200	1800	3400	4300	2900	1400	-900	1100	-2000	-17	61	-59
VERMONT	2800	1000	1800	4100	3300	800	1300	2300	-1000	46	230	-56
VIRGINIA	24400	8700	15700	26400	19400	7000	2000	10700	-8700	8	123	-55
WASHINGTON	16900	5800	11000	19000	13000	5900	2100	7200	-5100	12	124	-46
WEST VIRGINIA	10300	3700	6600	9300	8200	1100	-1000	4500	-5500	-10	122	-83
WISCONSIN	27100	9500	17600	25300	17200	8100	-1800	7700	-9500	-7	81	-54
WYOMING	1900	700	1200	1800	1300	500	-100	600	-700	-5	86	-58
NATION	1,219,300	435,200	784,100	1,045,000	766,900	278,200	-174,300	331,700	-505,900	-14	76	-65

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[1] Requirements projections from Jean L. J. Lum with GregoryLeonhard, *Panel of Expert Consultants: Final Report,* Boulder, Colo.: WICHE, 1978.

[2] Resources projections prepared by the Divison of Nursing, DHEW, 1978.

[3] The sum of the parts may not equal the total due to rounding.

[4] Figures have been rounded to the nearest 100.

[5] Where a negative (–) appears the resources are less than the requirements.

Table VI.9

Comparison of 1982 FTE RN Requirements and Resources for All States Plus the District of Columbia and for the Nation
Part II: Upper Bound Criteria

State	Requirements[1]			Resources[2]			Numerical difference[5]			Percentage Difference [5]		
	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total	AD/Dip.	Bacc & Above	Total	AD/Dip.	Bacc. & Above
ALABAMA	26500	8900	17600	13400	9800	3600	-13100	900	-14000	-49	10	-80
ALASKA	2300	800	1600	3400	1900	1500	1100	1100	-100	48	138	-6
ARIZONA	16200	5300	10900	16500	11100	5400	300	5800	-5500	2	109	-50
ARKANSAS	16600	5600	11000	7300	6300	1000	-9300	700	-10000	-56	13	-91
CALIFORNIA	150500	51100	99400	80400	55400	25100	-70100	4300	-74300	-47	8	-75
COLORADO	19900	6700	13200	17100	10700	6400	-2800	4000	-6800	-14	60	-52
CONNECTICUT	25100	8400	16700	19500	14600	5000	-5600	6200	-11700	-22	74	-70
DELAWARE	5000	1700	3300	4500	3200	1300	-500	1500	-2000	-10	88	-61
DIST OF COLUMBIA	9200	3200	6000	6500	3800	2800	-2700	600	-3200	-29	19	-53
FLORIDA	65200	22900	42400	41500	35700	5700	-23700	12800	-36700	-36	56	-87
GEORGIA	37000	12500	24500	27200	21500	5700	-9800	9000	-18800	-26	72	-77
HAWAII	5200	1800	3400	4200	2900	1300	-1000	1100	-2100	-19	61	-62
IDAHO	5300	1800	3500	3500	2900	600	-1800	1100	-2900	-34	61	-83
ILLINOIS	86400	29000	57400	49200	34400	14800	-37200	5400	-42600	-43	19	-74
INDIANA	40000	13300	26700	20400	15300	5100	-19600	2000	-21600	-49	15	-81
IOWA	23300	7800	15500	14400	11500	2900	-8900	3700	-12600	-38	47	-81
KANSAS	18800	6400	12400	11700	8700	3000	-7100	2300	-9400	-38	36	-76
KENTUCKY	22800	7500	15300	13900	10600	3300	-8900	3100	-12000	-39	41	-78
LOUISIANA	27300	9000	18200	14900	10500	4400	-12400	1500	-13800	-45	17	-76
MAINE	8200	2700	5500	5500	4700	800	-2700	2000	-4700	-33	74	-85
MARYLAND	30900	10400	20500	23100	16000	7100	-7800	5600	-13400	-25	54	-65
MASSACHUSETTS	56500	19100	37400	45400	33200	12200	-11100	14100	-25200	-20	74	-67
MICHIGAN	65700	21900	43800	41300	31400	9900	-24400	9500	-33900	-37	43	-77
MINNESOTA	36100	12300	23800	23700	17300	6400	-12400	5000	-17400	-34	41	-73
MISSISSIPPI	16200	5300	10900	10000	7700	2400	-6200	2400	-8500	-38	45	-78
MISSOURI	38900	13100	25800	19500	14800	4700	-19400	1700	-21100	-50	13	-82
MONTANA	6400	2100	4300	3900	2800	1100	-2500	700	-3200	-39	33	-74

Table VI.9 (continued)

Part II: Upper Bound Criteria

State	Requirements[1]			Resources[2]			Numerical difference[5]			Percentage Difference[5]		
	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total[3]	AD/Dip.[4]	Bacc. &[4] Above	Total	AD/Dip.	Bacc & Above	Total	AD/Dip.	Bacc. & Above
NEBRASKA	12800	4300	8500	9300	6700	2600	-3500	2400	-5900	-27	56	-69
NEVADA	4800	1600	3200	4400	3500	900	-400	1900	-2300	-8	119	-72
NEW HAMPSHIRE	7800	2700	5200	5500	4500	1000	-2300	1800	-4200	-29	67	-81
NEW JERSEY	52300	17700	34600	38700	29200	9500	-13600	11500	-25100	-26	65	-73
NEW MEXICO	6700	2200	4600	4500	3500	1100	-2200	1300	-3500	-33	59	-76
NEW YORK	154600	51700	102900	101900	70200	31700	-52700	18500	-71200	-34	36	-69
NORTH CAROLINA	36700	12100	24600	26700	20000	6700	-10000	7900	-17900	-27	65	-73
NORTH DAKOTA	5700	1900	3800	2900	2100	800	-2800	200	-3000	-49	11	-79
OHIO	83600	28100	55600	60900	49300	11700	-22700	21200	-43900	-27	75	-79
OKLAHOMA	20900	7000	13900	11600	8900	2700	-9300	1900	-11200	-44	27	-81
OREGON	15200	5100	10000	12100	8600	3500	-3100	3500	-6500	-20	69	-65
PENNSYLVANIA	94600	32200	62400	72700	53400	19300	-21900	21200	-43100	-23	66	-69
RHODE ISLAND	8000	2700	5200	5200	3600	1600	-2800	900	-3600	-35	33	-69
SOUTH CAROLINA	18600	6100	12500	13100	10100	3000	-5500	4000	-9500	-30	66	-76
SOUTH DAKOTA	6300	2100	4300	4200	3300	1000	-2100	1200	-3300	-33	57	-77
TENNESSEE	31700	10600	21100	15900	12500	3400	-15800	1900	-17700	-50	18	-84
TEXAS	93400	31200	62200	51800	34100	17700	-41600	2900	-44500	-45	9	-72
UTAH	7200	2300	4900	4300	2900	1400	-2900	600	-3500	-40	26	-71
VERMONT	3900	1300	2600	4100	3300	800	200	2000	-1800	5	154	-69
VIRGINIA	33300	11100	22200	26400	19400	7000	-6900	8300	-15200	-21	75	-68
WASHINGTON	24900	8200	16600	19000	13000	5900	-5900	4800	-10700	-24	59	-64
WEST VIRGINIA	13800	4700	9200	9300	8200	1100	-4500	3500	-8100	-33	74	-88
WISCONSIN	38500	13000	25700	25300	17200	8100	-13300	4200	-17600	-34	32	-68
WYOMING	2600	900	1800	1800	1300	500	-800	400	-1300	-31	44	-72
NATION	1,677,000	564,600	1,112,400	1,045,400	766,900	278,200	-632,000	202,300	-834,200	-38	36	-75

[1] Requirements projections from Jean L. J. Lum with Gregory Leonhard, *Panel of Expert Consultants: Final Report*, Boulder, Colo.: WICHE, 1978.

[2] Resources projections prepared by the Division of Nursing, DHEW, 1978.

[3] Figures have been rounded to the nearest 100.

[5] Where a negative (–) appears, the resources are less than the requirements.

Table VI.10

Ranking of All States Plus the District of Columbia by Percentage Difference for FTE RNs Resources to Requirements and Comparisons with the Nation[1]

Part I: Lower Bound Criteria

Total RNs		RNs with Associate Degree/Diploma		RNs with Baccalaureate Degree and Above	
State	Ranking	State	Ranking	State	Ranking
Alaska	1	Vermont	1	Alaska	1
Vermont	2	Alaska	2	Colorado	2
Arizona	3	Nevada	3	Arizona	3
Delaware	4.5	Arizona	4	District of Columbia	4
Nevada	4.5	Delaware	5	Delaware	6
Colorado	6	Maine	6	Hawaii	6
Oregon	7	Georgia	7	Washington	6
Massachusetts	8.5	Connecticut	8	Oregon	8
Washington	8.5	Massachusetts	9	Maryland	9
Hawaii	10	Ohio	10	Massachusetts	10
Connecticut	11	Oregon	11	Wisconsin	11
Virginia	12	New Hampshire	12	Nebraska	12.5
Pennsylvania	13	Washington	13	Virginia	12.5
Georgia	14	Idaho	14.5	Pennsylvania	14.5
Maryland	15.5	Virginia	14.5	Vermont	14.5
Nebraska	15.5	West Virginia	16	Connecticut	17
New Jersey	17	South Dakota	17	New York	17
Ohio	18	Pennsylvania	18.5	Rhode Island	17
New Hampshire	20	South Carolina	18.5	Wyoming	19
North Carolina	20	New Jersey	20	Texas	20.5
South Carolina	20	Colorado	21	Utah	20.5
Maine	23	Nebraska	22	Minnesota	23
South Dakota	23	North Carolina	23	Nevada	23
Wyoming	23	Hawaii	24	New Jersey	23
District of Columbia	25.5	New Mexico	25	North Carolina	25
New Mexico	25.5	Florida	26	Montana	26
Minnesota	27.5	Maryland	27	California	27.5
Wisconsin	27.5	Iowa	28	Illinois	27.5
Idaho	29	Minnesota	29	Kansas	30
New York	31	Mississippi	30	Louisiana	30
Rhode Island	31	Wyoming	31	New Mexico	30
West Virginia	31	Michigan	32	Georgia	33
Florida	34	Kansas	33.5	South Carolina	33
Iowa	34	Wisconsin	33.5	South Dakota	33
Kansas	34	Kentucky	35	Michigan	35.5
Michigan	36.5	Oklahoma	36	Mississippi	35.5
Mississippi	36.5	New York	37	North Dakota	37
Kentucky	39	Rhode Island	38	Kentucky	38.5
Montana	39	Montana	39	Ohio	38.5
Utah	39	Utah	40	Alabama	40.5
Oklahoma	41	District of Columbia	42	Oklahoma	40.5
Texas	42	Illinois	42	New Hampshire	42
Illinois	43	Louisiana	42	Indiana	43.5
Louisiana	44	Tennessee	44	Iowa	43.5
California	45	Indiana	45	Missouri	45
North Dakota	46	Arkansas	46.5	Idaho	46
Alabama	47.5	Missouri	46.5	Tennessee	47
Indiana	47.5	Alabama	48.5	Maine	48
Missouri	49	Texas	48.5	Florida	49
Tennessee	50	California	50	West Virginia	50
Arkansas	51	North Dakota	51	Arkansas	51

(- - -) States listed above dashed line will have resources greater than their requirements.

(═) States listed above double lines will have resources to requirements greater than total national percentage differences.

Table VI.10

Ranking of All States Plus the District of Columbia by Percentage Difference for FTE RNs Resources to Requirements and Comparisons with the Nation[1]

Part II: Upper Bound Criteria

Total RNs		RNs with Associate Degree/Diploma		RNs with Baccalaureate Degree and Above	
State	Ranking	State	Ranking	State	Ranking
Alaska	1	Vermont	1	Alaska	1
Vermont	2	Alaska	2	Arizona	2
Arizona	3	Nevada	3	Colorado	3
Nevada	4	Arizona	4	District of Columbia	4
Delaware	5	Delaware	5	Delaware	5
Colorado	6	Ohio	6.5	Hawaii	6
Hawaii	7	Virginia	6.5	Washington	7
Massachusetts	8.5	Connecticut	9.5	Maryland	8.5
Oregon	8.5	Maine	9.5	Oregon	8.5
Virginia	10	Massachusetts	9.5	Massachusetts	10
Connecticut	11	West Virginia	9.5	Virginia	11.5
Pennsylvania	12	Georgia	12	Wisconsin	11.5
Washington	13	Oregon	13	Nebraska	15
Maryland	14	New Hampshire	14	New York	15
Georgia	15.5	Pennsylvania	15.5	Pennsylvania	15
New Jersey	15.5	South Carolina	15.5	Rhode Island	15
Nebraska	18	New Jersey	17.5	Vermont	15
North Carolina	18	North Carolina	17.5	Connecticut	18
Ohio	18	Hawaii	19.5	Utah	19
District of Columbia	20.5	Idaho	19.5	Nevada	21
New Hampshire	20.5	Colorado	21	Texas	21
South Carolina	22	New Mexico	22.5	Wyoming	21
Wyoming	23	Washington	22.5	Minnesota	24
Maine	25.5	South Dakota	24	New Jersey	24
New Mexico	25.5	Florida	25.5	North Carolina	24
South Dakota	25.5	Nebraska	25.5	Illinois	26.5
West Virginia	25.5	Maryland	27	Montana	26.5
Idaho	29.5	Iowa	28	California	28
Minnesota	29.5	Mississippi	29	Kansas	30.5
New York	29.5	Wyoming	30	Louisiana	30.5
Wisconsin	29.5	Michigan	31	New Mexico	30.5
Rhode Island	32	Kentucky	32.5	South Carolina	30.5
Florida	33	Minnesota	32.5	Georgia	34
Michigan	34	Kansas	34.5	Michigan	34
Iowa	36	New York	34.5	South Dakota	34
Kansas	36	Montana	36.5	Kentucky	36.5
Mississippi	36	Rhode Island	36.5	Mississippi	36.5
Kentucky	38.5	Wisconsin	38	North Dakota	38.5
Montana	38.5	Oklahoma	39	Ohio	38.5
Utah	40	Utah	40	Alabama	40
Illinois	41	District of Columbia	41.5	Indiana	42.5
Oklahoma	42	Illinois	41.5	Iowa	42.5
Louisiana	43.5	Tennessee	43	New Hampshire	42.5
Texas	43.5	Louisiana	44	Oklahoma	42.5
California	45	Indiana	45	Missouri	45
Alabama	47	Arkansas	46.5	Idaho	46
Indiana	47	Missouri	46.5	Tennessee	47
North Dakota	47	North Dakota	48	Maine	48
Missouri	49.5	Alabama	49	Florida	49
Tennessee	49.5	Texas	50	West Virginia	50
Arkansas	51	California	51	Arkansas	51

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[1] (- - -) States listed above dashed line will have resources greater than their requirements.

(==) States listed above double lines will have resources to requirements greater than total national percentage differences.

Note: No state will have resources greater than projected requirements for RNs with baccalaureate and higher degrees.

Table VI.11

Comparisons of 1982 FTE LPN Requirements and Resources for All States Plus the District of Columbia and for the Nation

Part I: Lower Bound Criteria

State	Requirements[1, 3]	Resources[2, 3]	Numerical Difference[4]	Percentage Difference[4]
ALABAMA	6400	10600	4200	66
ALASKA	400	600	200	50
ARIZONA	3300	4500	1200	36
ARKANSAS	4600	6700	2100	46
CALIFORNIA	39200	62600	23400	60
COLORADO	5500	5200	-300	-5
CONNECTICUT	6900	6400	-500	-7
DELAWARE	1000	1000	0	0
DIST OF COLUMBIA	1700	2100	400	24
FLORIDA	15200	19000	3800	25
GEORGIA	10300	21400	11100	108
HAWAII	1100	2500	1400	127
IDAHO	1400	2500	1100	79
ILLINOIS	20100	13100	-7000	-35
INDIANA	9400	9500	100	1
IOWA	6600	7300	700	11
KANSAS	5000	4400	-600	-12
KENTUCKY	4600	6800	2200	48
LOUISIANA	6700	10300	3600	54
MAINE	2200	2200	0	0
MARYLAND	7500	6800	-700	-9
MASSACHUSETTS	15500	12900	-2600	-17
MICHIGAN	15500	22100	6600	43
MINNESOTA	10900	10800	-100	-1
MISSISSIPPI	3700	4800	1100	30
MISSOURI	9400	11300	1900	20
MONTANA	1500	1500	0	0
NEBRASKA	3800	4700	900	24
NEVADA	900	1400	500	56
NEW HAMPSHIRE	2000	1800	-200	-10
NEW JERSEY	11900	25300	13400	113
NEW MEXICO	1500	2800	1300	87
NEW YORK	35000	44300	9300	27
NORTH CAROLINA	7000	11300	4300	61
NORTH DAKOTA	1600	1600	0	0
OHIO	19400	26300	6900	36
OKLAHOMA	6300	8100	1800	29
OREGON	4500	3400	-1100	-24
PENNSYLVANIA	22700	21300	-1400	-6
RHODE ISLAND	1800	2400	600	33
SOUTH CAROLINA	4000	7200	3200	80
SOUTH DAKOTA	1800	1400	-400	-22
TENNESSEE	6500	17200	10700	165
TEXAS	23800	40000	16200	68
UTAH	1500	3300	1800	120
VERMONT	1000	1500	500	50
VIRGINIA	6700	12200	5500	82
WASHINGTON	8400	7300	-1100	-13
WEST VIRGINIA	2500	4000	1500	60
WISCONSIN	12100	9900	-2200	-18
WYOMING	600	700	100	17
NATION	405,700	518,000	112,300	28

[1] Requirements projections from Jean L. J. Lum with Gregory Leonhard, *Panel of Expert Consultants* Final Report, Boulder, Colo.: WICHE, 1978.

[2] Resources projections prepared by the Division of Nursing, DHEW, 1978.

[3] Figures have been rounded to the nearest 100.

[4] Where a negative (–) appears, the resources are less than the requirements.

Table VI.11

Comparisons of 1982 FTE LPN Requirements and Resources for All States Plus the District of Columbia and for the Nation

Part II: Upper Bound Criteria

State	Requirements[1, 3]	Resources[2, 3]	Numerical[4] Difference	Percentage[4] Difference
ALABAMA	9500	10600	1100	12
ALASKA	600	600	0	0
ARIZONA	4800	4500	-300	-6
ARKANSAS	7100	6700	-400	-6
CALIFORNIA	59500	62600	3100	5
COLORADO	8500	5200	-3300	-39
CONNECTICUT	10500	6400	-4100	-39
DELAWARE	1400	1000	-400	-29
DIST OF COLUMBIA	2200	2100	-100	-5
FLORIDA	22100	19000	-3100	-14
GEORGIA	16000	21400	5400	34
HAWAII	1500	2500	1000	67
IDAHO	2100	2500	400	19
ILLINOIS	29100	13100	-16000	-55
INDIANA	13800	9500	-4300	-31
IOWA	10000	7300	-2700	-27
KANSAS	7500	4400	-3100	-41
KENTUCKY	6500	6800	300	5
LOUISIANA	10100	10300	200	2
MAINE	3400	2200	-1200	-35
MARYLAND	10800	6800	-4000	-37
MASSACHUSETTS	23300	12900	-10400	-45
MICHIGAN	22800	22100	-700	-3
MINNESOTA	16600	10800	-5800	-35
MISSISSIPPI	5300	4800	-500	-9
MISSOURI	14100	11300	-2800	-20
MONTANA	2200	1500	-700	-32
NEBRASKA	6000	4700	-1300	-22
NEVADA	1200	1400	200	17
NEW HAMPSHIRE	2900	1800	-1100	-38
NEW JERSEY	17000	25300	8300	49
NEW MEXICO	2100	2800	700	33
NEW YORK	48200	44300	-3900	-8
NORTH CAROLINA	9600	11300	1700	18
NORTH DAKOTA	2400	1600	-800	-33
OHIO	28300	26300	-2000	-7
OKLAHOMA	9900	8100	-1800	-18
OREGON	6800	3400	-3400	-50
PENNSYLVANIA	32600	21300	-11300	-35
RHODE ISLAND	2600	2400	-200	-8
SOUTH CAROLINA	5700	7200	1500	26
SOUTH DAKOTA	2700	1400	-1300	-48
TENNESSEE	9100	17200	8100	89
TEXAS	36300	40000	3700	10
UTAH	2200	3300	1100	50
VERMONT	1400	1500	100	7
VIRGINIA	9300	12200	2900	31
WASHINGTON	13600	7300	-6300	-46
WEST VIRGINIA	3300	4000	700	21
WISCONSIN	18800	9900	-8900	-47
WYOMING	900	700	-200	-22
NATION	594,500	518,000	-76,500	-13

[1] Requirements projections from Jean L. J. Lum with Gregory Leonhard, *Panel of Expert Consultants: Final Report*, Boulder, Colo.: WICHE, 1978.

[2] Resources projections prepared by the Divison of Nursing, DHEW, 1978.

[3] Figures have been rounded to the nearest 100.

[4] Where a negative (−) appears the resources are less than the requirements.

Table VI.12

Ranking of All States Plus the District of Columbia by Percentage Difference for FTE LPNs Resources to Requirements, Lower and Upper Bound Criteria[1]

Lower Bound Criteria		Upper Bound Criteria	
State	Ranking	State	Ranking
Tennessee	1	Tennessee	1
Hawaii	2	Hawaii	2
Utah	3	Utah	3
New Jersey	4	New Jersey	4
Georgia	5	Georgia	5
New Mexico	6	New Mexico	6
Virginia	7	Virginia	7
South Carolina	8	South Carolina	8
Idaho	9	West Virginia	9
Texas	10	Idaho	10
Alabama	11	North Carolina	11
North Carolina	12	Nevada	12
California	13.5	Alabama	13
West Virginia	13.5	Texas	14
Nevada	15	Vermont	15
Louisiana	16	California	16.5
Alaska	17.5	Kentucky	16.5
Vermont	17.5	Louisiana	18
Kentucky	19	Alaska	19
Arkansas	20	Michigan	20
Michigan	21	District of Columbia	21
Arizona	22.5	Arizona	22.5
Ohio	22.5	Arkansas	22.5
Rhode Island	24	Ohio	24
Mississippi	25	New York	25.5
Oklahoma	26	Rhode Island	25.5
New York	27	Mississippi	27
Florida	28	Florida	28
District of Columbia	29.5	Oklahoma	29
Nebraska	29.5	Missouri	30
Missouri	31	Nebraska	31.5
Wyoming	32	Wyoming	31.5
Iowa	33	Iowa	33
Indiana	34	Delaware	34
Delaware	36.5	Indiana	35
Maine	36.5	Montana	36
Montana	36.5	North Dakota	37
North Dakota	36.5	Maine	39
Minnesota	39	Minnesota	39
Colorado	40	Pennsylvania	39
Pennsylvania	41	Maryland	41
Connecticut	42	New Hampshire	42
Maryland	43	Colorado	43.5
New Hampshire	44	Connecticut	43.5
Kansas	45	Kansas	45
Washington	46	Massachusetts	46
Massachusetts	47	Washington	47
Wisconsin	48	Wisconsin	48
South Dakota	49	South Dakota	49
Oregon	50	Oregon	50
Illinois	51	Illinois	51

[1] (- - -) States listed above dashed line will have resources greater than their requirements.

(—) States listed above double lines will have resources to requirements greater than total national percentage differences.

Table VI.13

Comparison of 1982 FTE Total RN and LPN Resources to Requirements on State-by-State Basis

Part I: Lower Bound Criteria

State	Supply to Requirements: Percentage Difference[1]		Supply of Resources in Comparison to Proposed Requirements[2]			
	Total RNs	LPNs	RNs ↑ LPNs ↑	RNs ↑ LPNs ↓	RNs ↓ LPNs ↑	RNs ↓ LPNs ↓
Alabama	30	66			x	
Alaska	100	50	x			
Arizona	39	36	x			
Arkansas	38	46			x	
California	25	60			x	
Colorado	21	5		x		
Connecticut	9	7		x		
Delaware	22	0	x			
District of Columbia	-6	24			x	
Florida	13	25			x	
Georgia	5	108	x			
Hawaii	11	127	x			
Idaho	8	79			x	
Illinois	23	35				x
Indiana	30	1			x	
Iowa	13	11			x	
Kansas	13	12				x
Kentucky	17	48			x	
Louisiana	24	54			x	
Maine	5	0			x	
Maryland	4	9		x		
Massachusetts	12	17		x		
Michigan	14	43			x	
Minnesota	7	1				x
Mississippi	14	30			x	
Missouri	31	20			x	
Montana	17	0			x	
Nebraska	4	24	x			
Nevada	22	56	x			
New Hampshire	2	10				x
New Jersey	2	113	x			
New Mexico	6	87			x	
New York	10	27			x	
North Carolina	2	61			x	
North Dakota	29	0			x	
Ohio	0	36	x			
Oklahoma	20	29			x	
Oregon	14	24		x		
Pennsylvania	6	6		x		
Rhode Island	10	33			x	
South Carolina	-2	80			x	
South Dakota	-5	22				x
Tennessee	32	165			x	
Texas	22	68			x	
Utah	17	120			x	
Vermont	46	50	x			
Virginia	8	82	x			
Washington	12	13		x		
West Virginia	10	60			x	
Wisconsin	-7	18				x
Wyoming	5	17			x	

[1] Where a negative sign (-) appears, the resources are less than the requirements.

[2] The arrows in the four columns above have the following meanings:

RNs ↑ LPNs ↑	Means supply of both RNs and LPNs equals or exceeds requirements.
RNs ↑ LPNs ↓	Means supply of RNs equals or exceeds requirements; supply of LPNs is below requirements.
RNs ↓ LPNs ↑	Means supply of RNs is below requirements; supply of LPNs equals or exceeds requirements.
RNs ↓ LPNs ↓	Means supply of both RNs and LPNs is below requirements.

Table VI.13

Comparison of 1982 FTE Total RN and LPN Resources to Requirements on State-by-State Basis

Part II: Upper Bound Criteria

State	Supply to Requirements: Percentage Difference[1]		Supply of Resources in Comparison to Proposed Requirements[2]			
	Total RNs	LPNs	RNs ↑ LPNs ↑	RNs ↑ LPNs ↓	RNs ↓ LPNs ↑	RNs ↓ LPNs ↓
Alabama	-49	12			X	
Alaska	48	0	X			
Arizona	2	-6		X		
Arkansas	-56	-6				X
California	-47	5			X	
Colorado	-14	-39				X
Connecticut	-22	-39				X
Delaware	-10	-29				X
District of Columbia	-29	-5				X
Florida	-36	-14				X
Georgia	-26	34			X	
Hawaii	-19	67			X	
Idaho	-34	19			X	
Illinois	-43	-55				X
Indiana	-49	-31				X
Iowa	-36	-27				X
Kansas	-38	-41				X
Kentucky	-39	5			X	
Louisiana	-45	2			X	
Maine	-33	-35				X
Maryland	-25	-37				X
Massachusetts	-20	-45				X
Michigan	-37	-3				X
Minnesota	-34	-35				X
Mississippi	-38	-9				X
Missouri	-50	-20				X
Montana	-39	-32				X
Nebraska	-27	-22				X
Nevada	-8	17			X	
New Hampshire	-29	-38				X
New Jersey	-26	49			X	
New Mexico	-33	33			X	
New York	-34	-8				X
North Carolina	27	18			X	
North Dakota	-49	-33				X
Ohio	-27	-7				X
Oklahoma	-44	-18				X
Oregon	-20	-50				X
Pennsylvania	-23	-35				X
Rhoda Island	-35	-8				X
South Carolina	-30	26			X	
South Dakota	-33	-48				X
Tennessee	-50	89			X	
Texas	-45	10			X	
Utah	-40	50			X	
Vermont	5	7	X			
Virginia	-21	31			X	
Washington	-24	-46				X
West Virginia	-33	21			X	
Wisconsin	-34	-47				X
Wyoming	-31	-22				X

[1] Where a negative sign (-) appears, the resources are less than the requirements.

[2] The arrows in the four columns above have the following meanings:

RNs ↑ LPNs ↑	Means supply of both RNs and LPNs equals or exceeds requirements.
RNs ↑ LPNs ↓	Means supply of RNs equals or exceeds requirements, supply of LPNs is below requirements.
RNs ↓ LPNs ↑	Means supply of RNs is below requirements, supply of LPNs equals or exceeds requirements.
RNs ↓ LPNs ↓	Means supply of both RNs and LPNs is below requirements.

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Chapter VII
Project Resources, Calendar, Impact, Publications and Reports

This chapter includes information to assist the reader in further understanding the Analysis and Planning Project by providing detail about:

- The resources—human and financial
- The calendar—major meetings held and visits relating to the project
- The impact—overview of the evaluation design
- The reports and publications—products of the project

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Participation in the project by the many individuals is reflected in the following lists. The lists are organized according to committee structure, staffing, and the nature of individuals' participation on a state-by-state basis. The titles, positions, and affiliations of all those listed refer to that in effect at the time the members served on the respective committees, task forces, or panel of expert consultants.

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  WICHE Train-the-Trainers

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N.E. Marenzo
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  Second National Conference

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  WICHE Training Seminar

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First National Conference

Kentucky

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First National Conference
Second National Conference

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Second National Conference

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SREB Training Seminar

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Second National Conference

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New York
  First National Conference
  Second National Conference

Margaret Walsh
Executive Director
National League for Nursing
New York
  Project Advisory Committee
  First National Conference
  Second National Conference

Anne R. Warner
Program and Communications
  Manpower Project
National Health Council
New York
  First National Conference

Paul Wing
New York State Education
  Department
Albany
  Second National Conference

Norma L. Woodruff
Associate in Nursing Education
The State Education Department
Albany
  First National Conference
  Second National Conference
  Pilot Test State Representative

North Carolina

Audrey Booth
Director of Statewide Activities
School of Nursing
University of North Carolina at
  Chapel Hill
Chapel Hill
  Train-the-Trainers
  SREB Training Seminar

Dale Jones
Research Triangle Institute
Triangle Park
  First National Conference

Nancy Milio
Associate Dean and Professor
University of North Carolina
  at Chapel Hill
Chapel Hill
  First National Conference
  Second National Conference

Nancy H. Saldana
Assistant Planning Director
Health Planning Council for
  Central North Carolina
Durham
  First National Conference

Ernestine B. Small
Assistant Professor
School of Nursing
University of North Carolina
  at Greensboro
Greensboro
  First National Conference
  Second National Conference
  SREB Regional Advisory Committee
  SREB Training Seminar

Carolyn E. Williams
Epidemiologist
School of Public Health
University of North Carolina at
  Chapel Hill
Chapel Hill
  Long Range Data Base Task Force
  First National Conference
  Second National Conference

North Dakota

Margaret F. Heyse
College of Nursing
University of North Dakota
Grand Forks
  Midwest Training Seminar

Mickey Knutson
Minot
  Midwest Regional Advisory
    Committee

Florence Kuntz
Trinity School of Nursing
Minot
  Midwest Training Seminar

Laverne Lee
Assistant Director for Nursing
Division of Nursing
State Department of Health
Bismarck
  First National Conference
  Second National Conference

Karen McDonald
Chairman, Department of Nursing
Mary College
Bismarck
  Midwest Training Seminar

Marge Rykken
Continuing Education College of
  Nursing
University of North Dakota
Grand Forks
  First National Conference
  Second National Conference

Joelyn Scriba
Chairman, Department of Nursing
Jamestown State College
Jamestown
  Midwest Training Seminar

Ohio

Jean H. Baird
Associate Executive Director
Mahoning and Shenango Area
Health Education Network
Youngstown
Midwest Training Seminar

Harold Enarson, President
Ohio State University
Columbus
National Model Task Force

Gloria Gay, Director
Mount Auburn Health Center
Cincinnati
First National Conference
Second National Conference

Christine Hayward
Akron
First National Conference
Second National Conference

Geraldine Price
Coordinator, Ohio Commission
on Nursing
Chief, Division of Nursing
Ohio Department of Health
Columbus
Midwest Training Seminar

Gloria Rookard
Akron
Second National Conference

Rozella Schlotfeldt
School of Nursing
Case Western Reserve
Cleveland
Midwest Regional Advisory
Committee
Panel of Expert Consultants

Ethelrine Shaw
Associate Professor
School of Nursing
Ohio State University
Columbus
First National Conference
Second National Conference

Frieda I. Shirk
Dean, School of Nursing
Capitol University
Columbus
Midwest Training Seminar

Judith A. Wood
Assistant Professor
School of Nursing
Case Western Reserve University
Cleveland
Midwest Training Seminar

Oklahoma

John L. Breuninger
Facility Director, PHN
PHS Indian Health Center
Eugaula
Midwest Regional Advisory
Committee
Second National Conference

Dorothy L. Hall
Director, Department of Nursing
Northeastern Oklahoma Community
College
Miami
Midwest Training Seminar

Gertrude Hotaling
Chief, Nursing Services
State Department of Health
State Capitol Station
Oklahoma City
First National Conference
Second National Conference
Panel of Expert Consultants

Barbara Holtzclaw
Norman
Midwest Training Seminar

Janet Kekahbah
Associate Director
American Indian Nurses' Association
Norman
Second National Conference

Martha Primeaux
Associate Professor of Nursing
University of Oklahoma Health
Science Center
Oklahoma City
State Model Task Force
First National Conference
Second National Conference

Frances J. Proctor
Oklahoma City
Midwest Training Seminar

Gloria A. Smith
Dean, College of Nursing
University of Oklahoma Health
Science Center
Oklahoma City
Midwest Regional Advisory
Committee
First National Conference
Second National Conference

Loretta Thompson
Coordinator/Instructor
Hillcrest Medical Center
Oral Roberts University
Tulsa
Midwest Training Seminar

Rosemary Wood
Executive Director
American Indian Nurses' Association
Norman
Second National Conference

Oregon

Terry Almadrigo
Director of Nursing Services
Oregon State Hospital
Salem
WICHE Training Seminar

Beverly C. Andre
Executive Director
Oregon State Board of Nursing
Portland
WICHE Training Semi

Naomi Ballard
Assistant Professor
School of Nursing
University of Oregon Health Sciences
Portland
WICHE Training Seminar

Jean E. Boyle
Dean, School of Nursing
University of Oregon Health Sciences
Portland
First National Conference
Second National Conference

Zona Clark
Director of Nursing Service
Saint Elizabeth Community Hospital
Baker
WICHE Training Seminar

Alice D. Dahlen
Director of Nursing
Meridian Park Hospital
Tualatin
WICHE Training Seminar

Betty M. Haugen
Chairperson, Department of Nursing
Southern Oregon State College
Ashland
First National Conference
Second National Conference

Vernia J. Huffman
Chief Planner for Aging
Mid-Willamette Valley Council of
Governments
Salem
WICHE Training Seminar

Roy E. Lieuallen
Chancellor
Oregon State System of Higher Education
Eugene
National Model Task Force

Paula A. McNeil
Associate Executive Director
Oregon Nurses' Association
Portland
First National Conference
Second National Conference

Phyllis Schroeder
Medford
WICHE Training Seminar

Ellen D. Strand
Director, Public Health Nursing
Oregon State Health Division
Portland
First National Conference

Janet Teaff
Associate Executive Director
Oregon Nursing Association
Portland
WICHE Training Seminar

Lenolia Tolton
Medical Intensive Care Unit
University Hospital North
Portland
WICHE Training Seminar

Pennsylvania

Laurie M. Gunter
Professor of Nursing and Human Development
Pennsylvania State University
Department of Nursing
College of Human Development
University Park
First National Conference
Second National Conference

Clifford H. Jordan
President
Pennsylvania Nurses' Association
Philadelphia
First National Conference
Second National Conference

William Montgomery
Deputy Secretary of Health
Pennsylvania State Health Department
Harrisburg
WICHE State Model Task Force
Second National Conference

Mabel H. Morris
Consultant of Nursing
DHEW Region III
Philadelphia
First National Conference

Dorothy J. Novello
Dean, Erie Institute for Nursing
Villa Maria College
Erie
Panel of Expert Consultants

Naomi I. Sayers
Nurse Consultant
Health Manpower Branch
DHEW - Region III
Philadelphia
Second National Conference

Rhode Island

Sylvia M. Blount
Clinical Specialist
Nursing Department
Veterans' Administration Hospital
Davis Park
Providence
Regional Advisory Committee

Alan Humphrey
Director of Health Statistics
Rhode Island Health Services Research, Inc.
SEARCH
Providence
Pilot Test State Representative

Hesook (Suzie) Kang
Associate Professor and Coordinator of Medical-Surgical Nursing
College of Nursing
University of Rhode Island
Kingston
State Model Task Force
First National Conference
Second National Conference
Train-the-Trainers
Panel of Expert Consultants

Catherine McGolderick
Dean, Division of Nursing
Rhode Island Junior College
Warwick
First National Conference
Second National Conference

Anne L. Milhaven
Executive Director
Rhode Island State Nurses' Association
Providence
NEBHE
Regional Advisory Committee
NEBHE Training Seminar
Second National Conference
Pilot Test State Representative

Alicebelle Rubotzky
Chief, Nursing Service
Veterans Administration Hospital
Davis Park
Providence
NEBHE Training Seminar

Jeanne Sherman
Coordinator, Continuing Education in Nursing
Rhode Island Junior College
Warwick
NEBHE Training Seminar

Lucille A. Sullivan
Chairperson
Department of Nursing
Rhode Island College
Providence
NEBHE Training Seminar

South Carolina

Marion P. Brown
Project Administrator
Health Manpower Statistics Project
Division of Health and Social Development
Columbia
SREB Training Seminar

Geraldine Labecki
Dean, College of Nursing
Clemson University
Clemson
First National Conference

Doris Watford Lister
Deputy State Director of Public Health Nursing
South Carolina Department of Health And Environmental Control
Columbia
SREB Training Seminar

Virginia C. Phillips
Director, Office of Nursing
South Carolina Department of Health and Environmental Control
Columbia
SREB Regional Advisory Committee
Regional Center

W. Allen Smith
Associate Dean, College of Medicine
Medical University of South Carolina

205

Charleston
First National Conference
Second National Conference

Elizabeth C. Stobo
Professor and Director
Program of Continuing Nursing
College of Nursing
University of South Carolina
Columbia
SREB Training Seminar

South Dakota

Ruth Brink
Community Health Nursing
Department of Nursing
Mount Marty College
Yankton
Midwest Training Seminar

Margaret E. Cashman
Associate Executive Secretary
South Dakota State Board of Nursing
Sioux Falls
First National Conference
Second National Conference

Elaine McCart, Instructor
Sioux Valley Hospital School of Nursing
Sioux Falls
Midwest Training Seminar

B. Jerald McClendon
Project Coordinator
Health Manpower Linkage Project
Office of the Secretary
South Dakota Department of Health
Pierre
First National Conference
Second National Conference

James C. Sorensen
Chairman, Department of Nursing
Mount Marty College
Yankton
Midwest Regional Advisory Committee

Joyce Steulpnagel
Sioux Falls
Midwest Training Seminar

Joyce Sugrue
Division of Social Welfare
Pierre
Midwest Training Seminar

Tennessee

Rosemary Bowman
Associate Executive Director
Tennessee Nurses' Association
Nashville
First National Conference
Second National Conference
SREB Training Seminar

Michael T. Bruner
Director, Complete Health Planning
Tennessee Department of Public Health
Nashville
First National Conference

Rosemond Gabrielson
President
American Nurses' Association
Director of Nursing Services
School of Nursing
Vanderbilt University
Nashville
Project Advisory Committee
First National Conference

Sylvia Hart
Dean, School of Nursing
University of Tennessee
Knoxville
Regional Center
SREB Regional Advisory Committee

Norma J. Long
Associate Professor
Director, Undergraduate Program
University of Tennessee
College of Nursing
Memphis
SREB Training Seminar

Ingeborg Mauksch
Professor and Family Nurse Clinician
Vanderbilt University
School of Nursing
Nashville
Second National Conference
Taxonomy Committee

Ward B. Studt
Memphis
First National Conference
Second National Conference

Texas

Marie Louise Baloga
DHEW - Region VI
Dallas
Second National Conference

Dixie Brown
Executive Director
Texas Nurses' Association, District 9
Houston
SREB Training Seminar

Sudie A. Cornell
Innovative Health Care, Inc.
Houston
SREB Training Seminar
Train-the-Trainers

Shirley L. Dooling
Dean, University of St. Thomas School of Nursing
Houston
SREB Training Seminar

Hector Gonzales
Chairman, Nursing Department
San Antonio College
San Antonio
State Model Task Force
Panel of Expert Consultants

Margaret B. Harty, Vice President
Institute of Health Sciences
Texas Women's University
Denton
First National Conference
Second National Conference

Virginia Jarratt, Dean
Harris College of Nursing
Texas Christian University
Forth Worth
First National Conference
Second National Conference

Edna Neumann
Dean, College of Health Sciences
Lamar University
Beaumont
Midwest Training Seminar

Utah

Margaret Adamson
Salt Lake City
WICHE Training Seminar

Ruth Brown
Ogden
WICHE Training Seminar

Ann Bruton, Assistant Project Director
Intermountain Health Care, Inc.
Salt Lake City
Demonstration Project

Pam Cipriano (Past President)
Elected Consultant
National Student Nurses' Association
Salt Lake City
First National Conference
Second National Conference

Verla B. Collins, Project Director
Intermountain Health Care, Inc.

Salt Lake City
  Demonstration Project
  WICHE Training Seminar
  First National Conference
  Second National Conference

Athleen Coyner
MDH Nursing Consultant
Utah State Division of Health
Salt Lake City
  WICHE Training Seminar

Beatrice S. Davis
Supervisor, City-County Health Dept.
Chairperson, Utah Nurses' Association
Legislative Committee
Salt Lake City
  First National Conference
  Second National Conference

Madeleine Leininger
Dean and Professor
College of Nursing
University of Utah
Salt Lake City
  Project Advisory Committee
  Taxonomy Committee
  First National Conference
  Second National Conference

Verle B. Lesnan
Ogden
  First National Conference
  Second National Conference

Klea Mordaunt
Salt Lake City
  WICHE Training Seminar

Julia Robinson
Salt Lake City
  WICHE Training Seminar

Duane Walker
Director of Nursing Service
University of Utah Hospital
Salt Lake City
  WICHE Training Seminar

Vermont

Kathy Boykin
Pediatric Nurse Practitioner
Calendonia Home Health Agency
St. Johnsbury
  Vermont State Pilot Test Advisory Committee

Paul Brodeur
Acting Commissioner of Mental Health
Agency of Human Services
Department of Mental Health
Montpelier
  Vermont State Pilot Test Advisory Committee

S. L. Burns
Professor of Medicine
President, Vermont State Medical Society
Dogoesbriant Unit
Medical Center Hospital of Vermont
Burlington
  Vermont State Pilot Test Advisory Committee

David Curtis
Attorney-at-Law
Hoff, Curtis, Bryan, Quinn, and Jenkins, Attorneys, Inc.
Burlington
  Vermont State Pilot Test Advisory Committee

Elizabeth Davis
Executive Director
Visiting Nurses' Association
Burlington
  Vermont State Pilot Test Advisory Committee
  Second National Conference

Caroline Desmond
Consumer Representative
Barker Farm Road
Jerico
  Vermont State Pilot Test Advisory Committee

Fernando A. Duran
Director
Community Mental Health Programs
State Department of Mental Health
Montpelier
  First National Conference

Patricia Dzubin
Director of Nursing Service
Copley Hospital, Inc.
Morrisville
  NEBHE Training Seminar

Faith G. Emerson
Associate Professor of Nursing
President, Vermont Board of Nursing
Department of Nursing
University of Vermont
Burlington
  Vermont State Pilot Test Advisory Committee
  Second National Conference

Jeanette Folta
President
Vermont State Nurses' Association
Professor of Nursing
University of Vermont
Burlington
  Vermont State Pilot Test Advisory Committee

Bernard Gresh
Director of Continuing Education
Recognition Program
Vermont State Nurses' Association
Burlington
  Vermont State Pilot Test Advisory Committee

Barbara Herrmann
Public Health Nurse Consultant
Comprehensive Health Planning
Montpelier
  NEBHE Training Seminar

Rollande Irvine, Director
Fanny Allen Memorial School of Practical Nursing
Winnoski
  NEBHE Training Seminar

Ann Janney
Executive Secretary
Vermont State Nurses' Association
Burlington
  Vermont State Model Field Development Advisory Committee

Patricia Kelly
Director of Nursing Services
Medical Center Hospital of Vermont
Burlington
  Regional Center
  Vermont State Model Field Development Advisory Committee
  Regional Advisory Committee

Pat Maitland, President
Practical Nurse Association of Vermont
Battleboro
  Vermont State Model Field Development Advisory Committee

Jean B. Milligan
Associate Dean
Division of Health Sciences
Director, School of Nursing
University of Vermont
Burlington
  Vermont State Model Field Development Advisory Committee
  First National Conference
  Second National Conference
  NEBHE Training Seminar

Russell Niquette
Chairman
Senate Health and Welfare Committee
Winnoski
Vermont State Model Field
Development Advisory Committee

Herluf Olsen, President
Vermont Hospital Association
Administrator, Medical Center Hospital
of Vermont
Burlington
Vermont State Model Field
Development Advisory Committee

Hilda Packard
Director of Nursing
Battleboro Retreat
Psychiatric Center
Battleboro
Vermont State Model Field
Development Advisory Committee

Anthony B. Robbins
Commission of Health Agency for
Human Services
State Department of Health
Burlington
Vermont State Model
Development Advisory Committee

Audrey R. Swarkowski
Public Health Nursing Supervisor
Visiting Nurse Association, Inc.
Burlington
Regional Advisory Committee

David Tuhalsky
President
Vermont Nursing Home Association
Central Vermont Hospital
Burlington
Vermont State Model Field
Development Advisory Committee

Virginia

Evelyn C. Bacon
Director, Nursing Program
J. Sargeant Reynolds Community
College
Richmond
SREB Training Seminar

Larrie J. Dean
Coordinator, Health Professions
and Occupations
State Council of Higher Education
Richmond
First National Conference
Second National Conference

Mary E. Dunn
Executive Director
Visiting Nurse Association of Virginia
McLean
First National Conference

Pauline H. Hord, Consultant
Office of Health Resources Opportunity
DHEW, PHS, HRA
Richmond
First National Conference
Second National Conference
SREB Regional Advisory
Committee
SREB Training Seminar

Virgin Islands

Ilva C. Benjamin
Chairman
Division of Nursing Education
College of the Virgin Islands
St. Thomas
First National Conference

Laura Yeargan
College of the Virgin Islands
St. Thomas
First National Conference
Second National Conference

Washington

Peggy Anet
Associate Coordinator for
Statewide Planning
Council for Office of
Postsecondary Education
Olympia
Pilot Test State Representative

Ann Angle, Director
Health Manpower Clearing House
Regional Medical Program
Seattle
WICHE Training Seminar

Lois Bergerson, Associate Professor
School of Nursing
Pacific Lutheran University
Tacoma
WICHE Training Seminar

Apolonio K. Buyagawan
Program Facilitator
Seattle
Demonstration Project

Annie Cadar
Outreach Nurse
Seattle
Demonstration Project

Bill Chance
Deputy Coordinator WACPE
Council for Office of
Postsecondary Education
Olympia
Pilot Test State Representative

Lola Chang
Research Nursing Assistant
Seattle
Demonstration Project

Tina Cheng
Outreach Nurse
Seattle
Demonstration Project

Thelma Cleveland
Associate Dean
Intercollegiate Center of Nursing
Spokane
WICHE Training Seminar

Eunice Cole
Director of Nursing Services
St. Luke's General Hospital
Bellingham
WICHE Training Seminar

Elaine Dao
Outreach Nurse
Seattle
Demonstration Project

Rheba De Tornyay
Dean, School of Nursing
University of Washington
Seattle
First National Conference

Hilke Faber
Seattle
WICHE Training Seminar

Ruth Fine
Bellevue
State Model Task Force
WICHE Training Seminar
First National Conference
Second National Conference

Jeanne Irving
Marysville
WICHE Training Seminar

Janet Kubota
Outreach Nurse
Seattle
Demonstration Project

David M. Lawrence
Seattle
First National Conference
Second National Conference

Doris Lock
Evaluator
Seattle
Demonstration Project

Betty K. Mitsunaga
Department of Psychosocial Nursing
School of Nursing
University of Washington
Seattle

Project Advisory Committee
First National Conference

Margaret Moran
Wenatchee
WICHE Training Seminar

Helen Nakagawa
Department of Psychosocial Nursing
School of Nursing
University of Washington
Seattle
Project Advisory Committee
First National Conference
Second National Conference

Margaret Ouchi, Director
Government Relations
WSNA
Seattle
WICHE Training Seminar
First National Conference

Sister Heide Parreno, Director
Demonstration Project
Seattle
First National Conference
Second National Conference
Demonstration Project

Anne Rohweder, Coordinator
Health Occupation Program
Olympic College
Bremerton
Project Advisory Committee
WICHE Training Seminar
Second National Conference

Hazel Schiffer
Consultant for Nursing
DHEW - Region X
Seattle
Project Advisory Committee
LRDB Task Force (Ex-Officio)
National Model Task Force (Ex-Officio)
State Model Task Force (Ex-Officio)
First National Conference
Second National Conference

Joan Stout
Chief, Nursing Service
Veterans' Administration Hospital American Lake Hospital
Tacoma
WICHE Training Seminar

Gary Troskie
Tacoma
WICHE Training Seminar
Train-the-Trainers

Barbara Tuck
Research Associate
Battelle Health Care Center
Seattle
WICHE Training Seminar

Joan Whinihan
Director of Public Relations
Washington State Nurses' Association
Seattle
WICHE Training Seminar

West Virginia

Jean M. Hoff
Associate Professor
Chairman, Senior Level Faculty
School of Nursing
West Virginia University
Morgantown
SREB Training Seminar

Gaynelle D. McKinney
Director of Continuing Education
School of Nursing
West Virginia University
Morgantown
Regional Center
First National Conference
Second National Conference
Train-the-Trainers

Oleta M. Riffe
Director, Bureau of Public Health Nursing
West Virginia Department of Health
Charleston
SREB Training Seminar

Jane Stout
Certification Officer
West Virginia State Health Department
South Charleston
SREB Training Seminar

Barbara Weller
Morgantown
First National Conference
Second National Conference

Wisconsin

Bernice Brynelson, Chief
Section of Public Health Nursing
Madison
First National Conference
Second National Conference

Marguerite P. Coffman
Dean, School of Nursing
University of Wisconsin - Eau Claire
Eau Claire
Midwest Training Seminar

Signe S. Cooper
Professor of Nursing
University Extension, Room 414
Madison
Midwest Training Seminar

Kay Horswill
Nursing Coordinator
Wisconsin Regional Medical Program
Madison
Midwest Regional Advisory Committee

Louise Smith
Acting Dean
University of Wisconson - Milwaukee
Milwaukee
Midwest Training Seminar

Wyoming

Virginia Boyer
Lander
WICHE Training Seminar
Train-the-Trainers

Anne Carpenter
Casper
WICHE Training Seminar

Mary Cassidy
Maternal and Child Health Nursing Counselor
Wyoming Department of Health
Cheyenne
WICHE Training Seminar

Roger L. Hayen
Director, Business and Economic Research
University of Wyoming College of Commerce and Industry
Laramie
First National Conference

Keiji Okano, Coordinator
Distributive Education and Health Occupations Education
State Department of Education
Hathaway Building
Cheyenne
First National Conference
Second National Conference

Dorothy Randell
Executive Director and Education Consultant
State Board of Nursing
Hathaway Building
Cheyenne
WICHE Training Seminar

Marion Schrum
Dean, School of Nursing
University of Wyoming
Laramie
WICHE Training Seminar
First National Conference
Second National Conference

Budget

The total budget for this project was $2,965,791. This money supported salaries for the project staff and their travel to meetings. (Not all staff were employed 100 percent of time for the project. The percentage of salary charged to the contract was consistent with the percent age of time devoted to project activities.) The budget covered the travel and per diem costs of all members who served on the numerous committees, task forces, and the Panel of Expert Consultants, and who attended the national conferences (exclusive of federal employees). No consulting fees or honoraria were paid to any task force member or national conference attendee. Computer costs associated with the data base were also covered. The costs for the various materials that were prepared for the meetings and the national conferences and for the reports and publications were part of the budget, as were editing, duplication, and mailing costs of the materials. In addition, office space, telephones, and supplies were covered.

Some of the objectives were achieved through the use of the services of subcontractors. The following is a list of each of the subcontracts and the amount:

The National Model	
Pugh-Roberts Associates, Inc., Cambridge, Massachusetts	$91,843
Training	
Nursing Care and Consultation, Ltd., Tucson, Arizona	68,707
Data Resource Services	
CDP Services, Inc., Bethesda, Maryland (Information Management Services, Inc.)	69,910
Regional Centers	
New England Board of Higher Education, Wellesley, Massachusetts	75,016
Southern Regional Education Board, Atlanta, Georgia	80,432
Saint Louis University, School of Nursing and Allied Health Professions, Saint Louis, Missouri	84,047
Demonstration Projects	
Saint Luke's Hospital, Boise, Idaho	39,722
City and County of Denver, Department of Health and Hospitals (Denver General Hospital), Denver, Colorado	62,743
Tri-County District Health Department, Aurora, Colorado	24,200
Department of Social Services, State of Iowa (Iowa Veterans' Home), Marshalltown, Iowa	42,004
Asian Community Health Center, Seattle, Washington	97,375
Department of Health and Environmental Sciences, State of Montana	24,611
Intermountain Health Care, Salt Lake City, Utah	18,490
Evaluation	
American Institutes for Research in the Behavioral Sciences, Palo Alto, California	52,370
Total	$831,470

Of the total budget, $831,470 was allocated for subcontracts, and the remaining amount, $2,134,321, was used to carry out the project activities directly by WICHE.

Project Calendar

The calendar of events sets forth the major meetings held and the presentations given on the project. However, it does not include the many staff meetings and informal interactions and contacts.

CALENDAR OF EVENTS

PRE-CONTRACT PERIOD

JANUARY-MARCH 1975

	1975 Jan.	Feb.	Mar.
Meetings			
Division of Nursing	27-28		3-4-5
Regional Representatives		6	
Illinois Implementation			
Committee on Nursing		7	
Presentations			
Colorado Nurses' Association		15	
Division of Nursing and ICONS			6
Visit			
Southern Regional Education Board		26	
Contract Signed			14

CALENDAR OF EVENTS (continued)

INITIAL CONTRACT PERIOD

MARCH 17, 1975 TO SEPTEMBER 17, 1976

	1975 Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1976 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
roject Advisory	17-18			24-25				1			8-9			20			23-24		
ong Range Data Collection and																			
se																			
Task Force					31	1					5-6			21-22-23				12-13	
axonomy Committee on Nursing						19-20				8-9		16-17		21-22-23					
actice																			
ational Model Task Force				26-27	30-31			30-31		11-12	4-5 29	19-20		21-22-23					
ate Model Task Force				2-3			4-5			4-5		19-20		21-22-23			20	30-31	
eld Development																			
Louisiana								8			15-16				20-21				
Iowa								13	12		19-20			13					
Illinois								14		17	26-27-28				5				
New Mexico							24	20		16	22-23			14					
Vermont								27				2-3			7				
Workshop in Boulder														5					
emonstration Projects																			
Denver, Colorado											19-20								
Englewood, Colorado											26								
Boise, Idaho												8-9							
Helena, Montana												10-11							
Seattle, Washington												12-13							
aluation Panel										3									

CALENDAR OF EVENTS (continued)

INITIAL CONTRACT PERIOD (continued)

MARCH 17, 1975 TO SEPTEMBER 17,1976 (continued)

		1975 Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1976 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Training																				
WICHE	Session I							22-23-24	6-7-8	5-6-7										
									13-14-15	17-18-19										
									20-21-22	20-21-22										
									27-28-29	24-25-26										
	Session II										8-9-10	12-13-14	2-3-4							
											15-16-17	19-20-21	9-10-11							
												26-27-28	16-17-18							
													23-24-25							
	Session III													22-23-24						
														31-	1-2					
																5-6-7				
MIDWEST	Session I														13-14	4-5				
	Session II															18-19	15-16			
NEBHE	Session I												19-20							
	Session II														26-27					
SREB	Session I												26-27							
	Session II														29-30					
Train-the-Trainers																			23-24-25	

CALENDAR OF EVENTS (continued)

INITIAL CONTRACT PERIOD (continued)

MARCH 17, 1975 TO SEPTEMBER 17,1976 (continued)

	1975 Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	1976 Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
egional Advisory Committee eetings*																			
Midwest													1-2		12-13		15,22		
NEBHE										17-18					13-14		22,29		
SPEB										15				8-9			22-23		
(Executive Committee for the Council)									5							16-17			
ational Conferences							29-30	1									21-22-23		
xecutive Committee				5-6, 28				2-3, 29	10-11	10	7	17	29-30	23	26	29	27		1
orkshops - Division of Nursing nd WICHE staff		7-8				1, 26, 27-28				9-10	27	8,18	8	12,19	27-28	15-16, 26 29-30	11		
resentations																			
ICONS										18									16
Washington State Board												13							
Conference												9							
Western Executive Directors																			
SREB Nursing Council		3																	
NEBHE Nursing Council								17						8-9					
Midwest Workshop													1						
WICHE Nursing Council								22											
Alaska Nurses' Association																	26		
Wyoming Nurses' Association															22				
American Nurses' Association																9			
ANA Advisory Council					23														
Division of Nursing																			17
National Advisory Council on Nurse Training									10										
Colorado State Board of Nursing																			
National League for Nursing																			
Management System Workshop																			
Information													17						
elated Meetings																			
Tarrytown		16-17-18																	
National Health Council		18-19	18-19-20									19-20-21							
NHPIC - Users' Panel								21-22		28-29									

he western regional advisory committee meetings were held in conjunction with the Project Advisory and the WCHEN Executive Board meetings.

CALENDAR OF EVENTS (continued)

EXTENSION PERIOD

SEPTEMBER 18, 1976 TO DECEMBER 31, 1978

	1976				1977												1978											
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
National Panel of Expert Consultants					31	23 24-25	30-31	1	11-12 13		20-21 22																	
Pilot Test States				13-14	7-8		21-22		9-10 11																			
Workshops-Division of Nursing and WICHE Staff		5	22-23	15-16 17	30	22-25	29	1	10,13		19,22	15-16	20							11,27	15							13
Presentations																												
Western Executive Directors					8																							
American Nurses' Association																						11						
National Advisory Council on Nurse Training																	23											
WICHE Nursing Council		20												21												18		
Sigma Theta Tau																				7								
Seattle Region X Workshop																				17-18								
PACT/Region VIII Workshop																				24-25 26								
Colorado Commission on Higher Education											15																	
Utah Planning Group																					22							
ANA Entry into Practice Conference																		13										
CNA Chautauqua																							31					
Arizona Nursing Directors Service									20																			
Wyoming Workshop																											16-17	
Related Meetings																												
NHPIC Users' Panel						22				15-16																		
Manpower (Ginsberg)										9-10																		
Contract Ends																												31

Project Impact

Under subcontract with the American Institutes for Research in the Behavioral Sciences (AIR), an evaluation plan was designed for determining the impact of the project for a period of two years following the project's termination. The full report of the impact evaluation design has been transmitted to the Division of Nursing, DHEW, for disposition. The content for this section was adapted from the final report submitted to WICHE by the American Institutes for Research, the evaluation subcontractor. An overview of the evaluation design follows.

The Impact Design

The evaluation approach in the impact design had been planned to incorporate several critical features.

1. It recognizes that the Analysis and Planning Project addressed the issue of supply and distribution by utilizing a variety of techniques. The proposed impact plan does not treat the project as an entity that succeeds or fails as measured by "average impact." In addition to measuring the overall impact of the project, the aim of the evaluation design is to identify the individual components that should be modified or that deserve serious consideration when further interventions are planned.
2. It is decision oriented. Determining what decisions are to be made is essential for deciding what data are needed, when they should be collected, and what range of results can be expected to influence the course of these decisions. Data will be gathered that will have an effect on the decisions to be made with regard to follow-on work or replication of the Analysis and Planning Project. To have practical value, the design has been planned to define the problem, to gether only necessary data, and to concentrate on information which has implication for the future.
3. It uses a variety of data sources. Objectivity of the data is enhanced by collecting data not only from participants but also from potential users who were not involved in the design of the project and for whom the project products were intended. Thus, before-and-after comparisons can be made, besides comparison with groups not intensively exposed to the project.
4. Because of the time limitation within which the impact must be measured (one and two years), the evaluation plan focuses on intermediate outcomes as well as on the ultimate outcome of improvement in the supply and distribution of nursing resources.

The common theme of the project is analysis and planning for improved distribution of nursing personnel and services. All the various components of the project address that common theme; however, the components are not necessarily interrelated. For example, the work of the Long-Range Data Collection and Use Effort and the Taxonomy Committees is interrelated, but the work of the Long-Range group and the Demonstration Projects is not. All components address the issue of supply and distribution, but from different perspectives.

This approach has direct implications for an impact plan. The project is composed of a number of discrete activities; therefore, the evaluation plan must measure the impact of these discrete activities. The several activities can be combined to produce a general effect on the issue of distribution and supply, and this general effect is also an object of impact evaluation. The overall effect can be dealt with only in rather general terms, leaving specific and detailed measurement to the individual project components. (As the components often have different objectives, combining the components produces broader and more comprehensive activities, but ones that are not necessarily more in-depth or specific.) This plan proposes to measure impact on two levels: (1) specific impact of each of the project components, and (2) general impact of the combined components.

The evaluation methodology has been designated to test a series of hypotheses relating both to the individual project components and also to overall project impact. The hypothesis and the project component to which each is related are listed on the next page. (The hypotheses were developed from component and project objectives prepared by Analysis and Planning Project staff.)

Component		Hypothesis
Overall Project	1.	Changes in the supply and distribution of nursing personnel and services can be identified as directly (or indirectly) associated with the project activities and products
	2.	Individual and agency awareness of issues critical to nursing supply and distribution can be identified as directly (or indirectly) associated with the products of the project
	3.	Informed nurses are involved in increasing numbers in planning capacities with HSAs and other health planning agencies
	4.	Legislation regarding nursing supply and distribution is in preparation or has actually been enacted and can be attributed (at least partially) to activities and/or products of the project
	5.	The nursing community generally is knowledgeable about and supports the Analysis and Planning Project
State Model	6.	The State Model is being used by the Division of Nursing to prepare reports of manpower resources and requirements for each state and for the nation
	7.	States have access to state data generated by the State Model and presented to Congress
	8.	There is a differential rate of implementation of the State Model among states
	9.	Implementation of the State Model in a state has influenced the actual or projected number, types, and distribution of nurses
	10.	Implementation of the State Model has influenced the planning and programming of education for nurses
Data Base	11.	The data base constructed for the State Model is available to and utilized by local, state, regional, and other agencies
Long-Range Data Collection and Use	12.	A plan for improved data collection has been completed and steps are under way to implement the plan
Taxonomy	13.	The taxonomy classification and descriptions have been used by nurses and other health care planners and have been accepted by the nursing community
National Model	14.	Data produced by the National Model have been used in planning for the future supply and distribution of nurses
Demonstration Projects	15.	The demonstration projects developed new patterns of patient care delivery, which had an influence on problems of nurse distribution at local and regional levels
Inventory of Innovations in Nursing	16.	The directory of innovative approaches has been a resource to the nursing community in providing ideas leading to improvement in current programs
Training	17.	Trainees have used their training in planning at local, state, regional, and national levels
	18.	Requests for training materials have been made by other interested users
Regional Centers	19.	Regional centers are addressing the problems of nurse supply and distribution in their regions
National Conferences	20.	The national conferences have encouraged the use of project products and have stimulated nurses to address issues relating to supply and distribution of nurses

These hypotheses form the basis of the impact measurement. The data to be gathered will relate directly to one or more of these hypotheses, and the purpose of the data analysis will be to test these hypotheses. Data will be sought on contributing factors to observed changes in an effort to determine the degree of relationship between these changes and the Analysis and Planning Project.

The impact plan identified potential measures for each hypothesis and groups to which questions should be addressed. Data sources to be considered include:

1. Data already available from reports, files, records, and the like
2. Data potentially available from information collected but not routinely reported, or from modification of present data collection
3. Data collected through special directed observations or monitoring
4. Data collected through interaction (questionnaires, interviews).

It should be clearly noted that both qualitative and quantitative data contribute to the overall evaluation. When using qualitative data, the evaluator must make an effort to scale or quantify the data to minimize the amount of bias or distortion introduced.

Data already available from reports, incidental records, and direct observations can be collected fairly easily. Additional information also will be necessary, and this should be collected primarily through questionnaires.

If only the data sources listed with the potential measures are considered, there are already 25 separate sources. In order to facilitate conceptualization of the data sources, these 25 sources have been combined into five subgroups. Considerable overlap is possible among the subgroups; this has been kept to a minimum in the following list.

A. Sources Consisting Primarily of Nurses
   1. Nursing leaders
   2. Nursing education programs
   3. American Nurses' Association and state nurses' associations (staff) and associations of ethnic minority nurses
   4. National League for Nursing (staff)
   5. Regional nursing organizations (staff and/or executive boards)
   6. Nursing group meetings or conventions
   7. General population of nurses

B. Sources Concerned with Planning
   8. Health systems agencies
   9. State Health planning groups, state planning groups for nurse manpower distribution, comprehensive health planning agencies, other planning agencies
   10. State boards of education
   11. State boards of nursing
   12. Surveying agencies that collect data on nurses (e.g., ANA, NLN, National Center for Health Statistics, Division of Nursing, Labor Department, Veterans Administration, military, Bureau of Indian Affairs, Census Bureau)

C. Sources Involved with the Analysis and Planning Project
   13. Persons attending Analysis and Planning Project training sessions
   14. Staff of demonstration projects
   15. Recipients of inventory of innovative approaches
   16. Participants at national conferences
   17. Field development state advisory groups and agency staff
   18. Regional advisory groups
   19. Analysis and Planning Project task force and advisory committee members

D. Funding Agency
   20. Division of Nursing

E. Other Sources
   21. Records and staff of the Analysis and Planning Project
   22. Journals, professional newspapers, state nursing publications in targeted states, major local newspapers
   23. Congressional and legislative proceedings
   24. Surveys by such groups as ANA, NLN, National Center for Health Statistics, Division of Nursing, American Medical Association, American Dental Association, American Hospital Association, Association of American Medical Colleges
   25. Nurse employers (including urban/rural, HSAs, employers with career development programs).

The projected plan would take two years. It was recommended that the evaluation begin after the end of the contract period.

Project Publications and Reports

To widely share information about the progress and the products of this project, periodic *Project Updates* and three publications were distributed to more than 5,000 individuals or agencies. In addition, the 15 reports have been distributed to targeted groups.

Project Update

The example of the *Project Update* that follows provides an idea of the format that was used. It was expressly chosen to share information addressing minority issues.

ANALYSIS and PLANNING for Improved Distribution of Nursing Personnel and Services

Project Update **August 1976**

GOAL: To strengthen, on a national scale, the nursing community's ability to analyze and plan for improved distribution of nursing personnel and services

SPONSOR: Western Interstate Commission for Higher Education

FUNDING: Division of Nursing, Bureau of Health Manpower, Department of Health, Education, and Welfare

OBJECTIVES:

- ○ To develop a National Model, using the System Dynamics approach, for projecting nursing requirements and resources five to twenty years into the future
- ○ To develop a State Model for projecting nursing requirements and resources one to five years ahead, at the state, regional, and national levels
- ○ To develop a data base to support the State Model
- ○ To plan for improved data collection in the future to support analysis and planning of nurse manpower supply, distribution, and requirements
- ○ To support demonstration projects and compile an inventory of innovative approaches for improving distribution of nursing skills and services
- ○ To support regional centers to analyze nurse manpower supply and distribution, to train staff for regional centers, and to help establish communication networks for regional and state-level planning
- ○ To train nurse leaders in the use of analytical models and data bases as planning tools
- ○ To conduct two national conferences
- ○ To design and implement an evaluation of project activities within the project period and to design an evaluation plan for determining the impact of the project over the following two years

WICHE PROJECT DIRECTOR COEDITS BOOK IN NURSING CARE FOR ETHNIC GROUPS

Marie Branch, R.N., Director of a WICHE project, Models for Introducing Cultural Diversity in Nursing Curricula, is coeditor of a new book, *Providing Safe Nursing Care for Ethnic People of Color,* brought out by Appleton-Century-Crofts.

Each contributing author is a nurse and a menber of one of the four major ethnic groups—Asian American, American Indian, black, and Chicano—whose cultural health problems are described in the book.

MINORITY ISSUES: A MAJOR PROJECT FOCUS

A major task of the Analysis and Planning project has been to identify and spell out minority issues that arise in efforts to improve distribution of nursing personnel and services. That work, in which many minority nursing leaders have participated, is summarized on the following pages of this *Project Update.*

But it will be of little use to know what the minority issues are in health care and nursing education unless this knowledge leads to improvements and corrective action. Analysis and planning are first steps. Project staff hope that their work on minority issues, and the work of many others on which project staff have drawn, will help ensure that those first steps are taken in the right direction.

Minority Resolution

At the First National Conference of the Analysis and Planning project, held in Denver in September of 1975, minority participants submitted a resolution. The resolution asked that "present and future project activities be implemented in such a manner that they include interests of minority nurses and consumers: Native Americans, Spanish speaking/Spanish surnamed, Blacks, Asians and individuals from U.S. Territories." It asked that gaps in minority data "be duly documented and that the methodology designed to collect new data on minority groups be subcontracted to minority firms," that "these data be incorporated into the data base and modeling efforts of this project," and that minority professionals be "especially included" in the project's training activities.

The Analysis and Planning project has not only responded affirmatively to specific recommendations in that resolution, but also has addressed minority issues and needs in several other ways:

- Minorities are included on the project's professional and support staff, and ethnic and racial groups are broadly represented on the project task forces and advisory bodies.
- Three of the seven nurse leaders commissioned to present issue papers at the Analysis and Planning project's Second National Conference are minorities, and two of the papers addressed minority issues in nurse manpower planning.

- The ANA Council on State Boards of Nursing has adopted a resolution, put forward by the Analysis and Planning project staff, which calls for five specific improvements in the collection of nursing data to support health-care planning, including the collection of data pertaining to the ethnic background of nurses.
- A special recruitment effort by project training staff achieved a 13 percent participation in the western training effort.
- A project to demonstrate a health-care program for a multicultural, multilingual Asian population, staffed by Asian-American nurses, is being supported by an Analysis and Planning project subcontract; the project's *Inventory of Innovations in Nursing* describes a number of undertakings designed to meet the special health needs of minority groups.
- Comprehensive discussions of minority problems in health-care delivery and the need for more data on minority nurses are included in Analysis and Planning project technical publications. The project report on long-range data collection and use will recommend that ethnic background be included as an element in demographic and biographic data on registered nurses and in data describing populations served by the health-care delivery system.
- After consultation with Analysis and Planning project staff at WICHE and the National Coalition of Ethnic Nurses of Color, the DHEW Division of Nursing has arranged, through the National Health Planning and Information Center, for Dr. Anita Alvarado of the University of New Mexico to develop a monograph on minority issues and data collection.

State Model Described

This *Project Update* contains articles that discuss minority concerns in nursing education and minority issues in health-services planning, and describes how the Analysis and Planning project's State Model can be used to address minority health issues.

Two authorities on minority health questions, Rosemary Wood and Juanita Godley, assisted project staff in the development of these articles.

Rosemary Wood, an Osage Indian from Pawhuska, Oklahoma, is Executive Director of the American Indian Nurses' Association. She earned a Master of Science degree in Nursing from Radcliffe College and has taught and held nursing education administrative posts for many years.

Juanita Godley is Associate Director of the Comprehensive Health Planning Council of Southeastern Michigan. She received a Master's degree in Public Health from Wayne State University and has worked extensively in planning for institutional services and state health planning.

The *Project Update* articles, like the papers on minority issues presented at the Second National Conference, summarize the background information that was taken into account in determining what specific efforts the Analysis and Planning project should initiate relative to minority issues and concerns.

MINORITY ISSUES IN NURSING EDUCATION

As the nursing profession looks to the future, addressing minority issues in nursing education will be one of the factors contributing to leadership in the field of health.

Nursing education is moving forward in analysis and planning, broadening the scope of basic and advanced preparation, defining new avenues for practice, strengthening the position of nursing in academia, and addressing minority issues. These trends are helping to strengthen the educational process to prepare nursing practitioners for today and the future.

In nursing as in many social sciences, minority group members bring a valuable dimension to the discipline, but on the whole are underrepresented. Generally speaking, American education has moved away from the long-standing practice of denying admission to minorities or segregating their education and today is facing the complex problem of providing equal access. Minority groups have some common and some unique experiences in education generally, and in nursing education specifically. Nursing initiatives such as recruitment and retention programs and the introduction of necessary content regarding minorities into nursing curricula, have potential for improving the quality of nursing education and health care across the country.

A good many factors that affect minority-group nursing education have been identified extensively in the literature and in the everyday operation of schools and colleges of nursing. These factors relate to minority stu-

Rosemary Wood, Executive Director of the American Indian Nurses' Association, collaborated with Analysis and Planning project staff in the preparation of this article.

dents, all faculty and curricula, minority-patient care, and minority-group access to all levels of nursing education.

The most salient concerns are 1) problems involving education of minorities, and 2) the inclusion of minority content, both cultural and racial, in the nursing curricula.

A host of problems and issues emerges as minorities from ghettos, reservations, and segregated or otherwise unusual schools and educational backgrounds confront limited career choices, counseling and financial barriers, and finally the admissions policies of the prenursing or nursing education system itself. Although academic adjustment may be a resulting problem with some, the more serious issue is one of general adjustment and acceptance of the system. The problems and issues can multiply exponentially as the varying characteristics of students, patients, faculty, administrators, and institutions come into play.

Many minority students start nurse training in less than baccalaureate collegiate programs. Therefore a pool develops of people who could increase their potential contribution to the profession through educational mobility. Although counseling and financial support should guide students into programs that match their potentials, the history of deficits in these support systems shows this ideal to be less than a reality. The need for upward-mobility opportunities in nursing education, financial supports, and strengthened professional endorsement of such programs becomes clear when we look at the distribution of nursing skills and services among minorities. When represented at all, minorities are, by and large, at the bottom.

A Bureau of Health Manpower report, *Minorities and Women in the Health Field,* indicates that the nursing-aide category has the highest proportion of minorities—27 percent. About 20 percent of practical nurses are minorities. While a smaller proportion of minorities is practicing as professional nurses, the percentage now in training is increasing. Nursing education has attracted more minorities than have other health-care fields: 11 percent as compared to 3 percent in osteopathy, 5.5 percent in medicine, 6 percent in optometry, 8 percent in pharmacy, and 9 percent in dentistry.

The National League for Nursing and other groups have endorsed the concept of encouraging career mobility through nursing education. Affirmative Action, which is being enhanced by supportive policies, programs, and financing, should be a long-range commitment to improving the health-care system through development of resources in nursing. While the past two decades have brought recognition and identification of minority issues in nursing, continued nationwide professional support is needed if progress is to be maintained.

Affirmative Action and other programs aimed at benefiting minorities should not compete with our other priorities, however; instead, they can be counterparts of progress. Projects such as Breakthrough in Nursing, Systems for Nursing Articulation Programs, Introduction of Cultural Diversity into Curricula, and scholarship funds such as the American Nurses' Association Minority Doctoral Fellowship Program have provided a beginning. They can be models for achieving greater emphasis and evaluation of the appropriateness of undertakings for different groups, settings, and regions.

The adequacy of structural and financial support must be continually evaluated and substantiated, so that American Indians, Asian Americans, blacks, and Spanish-speaking/Spanish-surnamed persons as well as minorities in the U.S. territories are afforded comprehensive educational support. Minority-group nurses are not only crucial resources to the total nursing profession, but become especially valuable for providing services in education and service institutions that might better serve similar minorities and now experience critical shortages. These groups have the potential of helping to alleviate various kinds of nursing shortages, and helping also to bridge the cultural gaps and overcome the long-standing failure of the education and health-care systems to serve minority-group populations.

The strengthening of curricula content will assist in the training of all nurses to be adequately prepared and constructive in providing nursing to minority-group patients and families. Regardless of ethnicity, nurses must be able to apply basic principles and use professional and community resources for providing safe, sound, professional practice to minority groups, as well as to others.

As nurses, we must continue to identify principles and resources and develop mechanisms for dissemination of information and practice criteria in order to address minority-education issues in a professional manner. Many ethnic nurses' organizations, state and national nurses' associations, facilities, schools, nursing leaders, government, and private foundations have taken initiatives in this direction.

PLANNING TO MEET MINORITY NEEDS FOR HEALTH SERVICES

As a major health profession, nursing can be strongly instrumental in changing the American health-care system for the better. At best, the needs of minority groups for health services are poorly met today. If it is conceded that the ability to improve the system carries with it the moral responsibility to redress the worst inequities first, then plainly the nursing profession should come to a full understanding of the health issues pertaining to American Indians, Asian Americans, blacks, and Spanish-speaking/Spanish-surnamed persons.

A good first step is to consider the National Health Planning and Resource Development Act of 1974 (Public Law 93-641, enacted January 4, 1975). This law speaks to the provision, evaluation, and coordination of health resources. Minorities, low-income groups, the aged, and persons in underserved areas will need special

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Juanita Godley, Associate Director of the Comprehensive Health Planning Council of Southeastern Michigan, collaborated with Analysis and Planning project staff in the preparation of this article.

attention from such a national planning effort if adequate access to health care is to be achieved for all Americans.

The goals of P.L. 93-641 are to facilitate the development of a national health policy, augment state and regional planning, and eventually authorize financial assistance for the development of resources to foster the health policy.

A framework for defining a policy is found in congressional statements about the nature of many problems and in the ten "health priorities" that the act states should be used in health-planning and resource-development programs. Congressional comments about health-system difficulties imply that both the public and health professionals contribute to problems. Consumers should become knowledgeable about preventive health care and the proper use of health services; professionals are given the mandate to address the quality and appropriate provision of care and cost considerations.

Health priorities specified in P.L. 93-641 include the provision of care of medically underserved populations, development of group practices and Health Maintenance Organizations, training and use of "physicians' assistants and nurse clinicians," the development and sharing of services for various levels of care by health-service institutions, promotion of disease-prevention activities, the promotion of quality-assurance activities, and adoption of uniform cost accounting and simplified reimbursement systems.

Ambitious as they may be, the goals and mission of the National Health Planning and Resource Development Act directly address minority health issues: lack of access to quality health care, high rates of preventable illnesses and disability, and frequent inability to assume or maintain the high cost of health care.

Minorities Continue to be Underserved

Although spending for health care and education has increased rapidly, minorities have not realized equitable health gains from the increase in dollars spent for health care. The following facts reflect some of the persistent issues:

- Minorities in urban and rural areas are most often critically underserved in relation to all health resources: manpower, facilities, and services.
- Minorities are poorly represented in the health professions.
- The life expectancy for nonwhites is 64.6 years, compared to the normal white life span of 71.7 years; black men have the shortest expectancy of all Americans.
- At every age from birth to age 75, mortality rates of most nonwhites are high; infant mortality for blacks is almost twice that of whites.
- While minorities are admitted to public hospitals at almost twice the rate of others, proportionately few minorities receive care in private hospitals.
- Disability strikes minorities at a rate 20 percent higher than others.
- Nonwhites are less likely to have health insurance.
- Nonwhites are less likely to receive health care from traditional providers, and those who do are seen for fewer visits.
- Nonwhites at every income level receive less health care than whites with comparable income.

These facts are not new: the inadequacies of minority health care have not lessened much over the years. Moreover, this kind of information has gaps and limitations. Each minority group has some unique health problems that are not highlighted, and some common problems also are not reflected. These must be sorted out constructively in a new approach to health planning.

Information-oriented health planning is relatively new. Important decisions about manpower, facilities, and services and their distribution are still made in diverse ways, by people who seek to shape the future by maintaining or changing tradition. The mission of P.L. 93-641 goes beyond the infrastructure of the National Council of Health Planning and Development, the State Health Planning and Development Agency and its State Health Coordinating Council, or the Health Systems Agency (HSA). Consideration of the priorities stipulated in the Act invites all health professions to address minority-group health issues as an integral part of the planning process.

Such health problems as hypertension, infectious diseases, accidents, mental illness, malnutrition, and anemia tend to occur more often among certain ethnic and racial minorities than among the general population. And there are environmental factors, cultural patterns, and complexion characteristics that require special knowledge for effectively planning and evaluating primary, secondary, and tertiary care for these groups.

Some priorities, like preventive care, are especially important to such high-risk populations, as means to reduce complications and lower the cost in lives. Preventive care calls for competent practitioners, available where they are needed. The factors causing shortages of personnel in inner cities, rural areas, Indian reservations, and elsewhere have to be faced, not only by professionals and planning agencies but by all levels of government.

New and emerging roles of nurses, physicians, and others have potential for significant impact, especially in the context of information-oriented analysis and planning for improved distribution of personnel, facilities, and services. In the health professions, minorities are grossly underrepresented. This necessitates concentrated planning and financing to attract, train, upgrade, and retain minorities in the health-care disciplines.

Different Worlds of Health Care

Experiences of minority groups may vary and the severity of health problems differ, but these groups tend to obtain services in a less than optimal manner. Crisis-oriented care is often provided only in crowded hospitals, clinics, or emergency rooms, after the illness is advanced or complicated. This is not to stereotype the minority consumer as always poor and uninformed. Certain health problems are interwoven with poverty, but not all are. Money and insurance do not buy services where few are available, or when mechanisms that foster proper use of services are not in operation.

At times, special studies, projects, or programs have provided limited, short-term access to health care, sometimes lacking in quality or dignity. Established delivery patterns are not flexible enough to accommodate cultural diversity in consumers. Folk beliefs and customs impact on health beliefs and behavior. Nurses, physicians, planners, educators, administrators, and others who are unaccommodating to cultural, racial, and language diversity may miss important cues for care, thereby compromising the effectiveness of services, education, or planning.

Fragmented, crisis-oriented, ineffective care results in higher costs in suffering, lives lost, and in the dollar cost of episodic, curative, and long-term treatment. It will serve the goals of both health-care professionals and the nation to promote preventive and adequate health services, and to reduce both the measurable and unmeasurable costs of poor health.

In short, minorities are underserved; they must have a wider range of health services; financing mechanisms must not prohibit the attainment of quality care; concentrated efforts are needed to attract and train minorities in all health professions.

Information and Data Needs

To accurately estimate future health needs and resources generally, and in particular to address minority issues in health care, information needs and problems must be defined and addressed. There is often a lack of uniformity, comparability, and compatibility in the collection and maintenance of health data. Much existing hard data is dated and inadequate for future planning. Other relevant soft information (judgments) may be overlooked. The collection of new data is difficult, costly, and time-consuming, and complicated by a time lag for availability and evaluation.

Data pertaining to morbidity and to use of services by ethnic group and residence are not readily accessible to individuals who could consider this information in planning for health manpower, facilities, and services. Laws concerning protection of the individuals' privacy may present even more serious constraints in gathering new data on minority health needs.

If available data or other information considered are not enlightening with respect to minorities, planning and estimating future health care for these groups inevitably will be inadequate also. Faced with information gaps and difficulties, planners have available several strategies for gathering and acting upon information concerning minorities:

- They can work with committees of minority and other informed consumers and providers, such as nurses and physicians. Their knowledge and resources are invaluable to the planning and implementation process.

- A working relationship with the emerging State Health Coordinating Committees (SHCC), the State Health Planning and Development Agencies (SHPDA), and health-statistics centers will be important in highlighting crucial issues.

- Where factual data are not available, plans should be made to secure better information.

Established institutions may have valuable resources, but traditional methods of operation may also be constraints. One barrier to progress is the exclusion of minorities and minority issues in routine planning. This may be caused by traditional agency structures and operations which foster discrimination, such as racism.

One authority has observed: "Essentially three levels of racism can be identified: individual, collective, and institutional. All three have harmful social and psychological effects. However, in the long run, institutional racism has the most serious consequence. As long as racist norms and/or standards remain the criteria for meaningful participation in the ongoing process of institutional life, [minority] groups will continue to be ignored in the decision making activities affecting the provision of health and social services required for survival" (Theodis Thompson, *The Impact of Institutional Planning on Health Care Delivery*, p.58).

What's Next

The Health Planning Resources Development Act of 1975 requires each of the 202 HSAs to develop and annually review a Health Systems Plan (HSP) and an

Annual Implementation Plan (AIP). The HSP is to detail a statement of goals for assuring availability and accessibility of quality health services at reasonable cost. Public hearings will be conducted and each plan should be published for public review. The AIP will spell out how an area's health plan goals can be achieved and it will set priorities among the objectives.

In addition, HSAs must assemble and analyze pertinent health data, approve or disapprove applications for federal funds for health programs within an area, make recommendations to the State Health Planning and Development Agency regarding facility planning, and make grants and contracts for technical assistance.

Many participants are necessary for this sort of effort. Multidisciplinary cooperation and collaboration have potential for new achievements. The needs and views of the professional may differ from those of the consumer, and financial constraints may affect goals. But skillful, informed planning can reconcile gaps and problems concerning health care in various kinds of communities. With respect to minorities, improved data gathering and interpretation is essential to the provision of relevant, effective care.

STATE MODEL DESIGN INCORPORATES MINORITY HEALTH CONCERNS

The Analysis and Planning project's State Model is designed to help prepare estimates of the number of nursing personnel who will be needed and available over the next five years. Essentially, the model provides the analytical structure in which data on nursing personnel and services can be organized systemmatically.

Part D of the Nurse Training Act of 1975 says that determinations of areas of nursing oversupply and undersupply should be made "in relation to the population of the area." Similarly, Assistant Surgeon General Jessie Scott, Director of the DHEW Division of Nursing, has stated that "we must remember that our purpose in apportioning our nursing wealth is to meet the actual needs of actual people."

Population Subgroup Needs

These statements underscore a seemingly obvious concern, but one that sometimes is not highlighted in planning for health: the need for nurses should be related to the population being served. Even more important, however, population subgroups need to be considered as well, because different populations will differ with respect to their health-care needs and how these needs can best be met.

- Morbidity and mortality rates will differ with respect to the age, sex, and ethnic distribution of the population.
- Occupation accounts for some variation in morbidity and motality rates: Coal miners are particularly susceptible to black lung disease; office workers are prone to cardiovascular disease.
- Due to poor housing conditions, children from families of low income have a higher incidence of lead poisoning.
- Educational attainment affects the health habits of the population.

Scope of State Model

The State Model facilitates the organization of data on the characteristics of population subgroups, health-status indicators, the services provided, and nursing personnel available and necessary to provide health services. Minority health concerns are integrated into this framework. These data are aggregated to the level of the Health Service Area (HSA).

Moreover, the State Model is flexible. Relevant data can be added as they become available. For example, past inventories of registered nurses (RNs) and licensed practical nurses (LPNs) did not contain racial or ethnic identifiers. But the State Model structure allows users to substitute RN and LPN data that may contain such identifiers.

The State Model has three parts:

- Nursing Personnel Information Base
- Requirements Analysis component
- Resources Analysis component

Brief descriptions follow of how these components specifically address minority concerns.

Nursing Personnel Information Base

The Nursing Personnel Information Base (NPIB) is that part of the State Model that provides the data needed to perform the various functions of the model. This component of the model has two basic purposes: 1) to provide a detailed set of information that will assist analysis of the current nursing personnel situation within the state (this set of information is contained in a series of "NPIB State Profile Reports"), and 2) to provide the information that will form a basis for the inputs to the Resources Analysis and the Requirements Analysis components.

To plan effectively for the future, one should have a thorough understanding of the current situation. This is especially true with regard to nursing. The profession is moving toward increasing specialization in practice and toward a more varied role in the overall health-care system. Any planning effort should recognize this diversity, taking into account the different kinds of nurses and the varied settings and roles in which they are operating, instead of simply considering the number available or needed.

NPIB can help planners and policy makers assess the current nursing manpower situation at a level of detail that captures the diversity present within the profession today. The component will allow its users to obtain a series of descriptive reports that present the most recent information available on the number and type of:

- Nursing personnel
- Facilities and services within the health-care delivery system
- Educational facilities and programs available to educate new personnel
- Demographic characteristics and indicators of the health needs of the client population

Data have been gathered from the Census Bureau, the National Center for Health Statistics, and the Center for Disease Control. Census data have been cross-tabulated by race, sex, and age to identify the extent of ethnic-minority concentration in each HSA. Data from the National League for Nursing's Special Survey of Schools of Nursing—Men and Minority Students and the American Nurses' Association Follow-up Study to the 1972 RN Inventory are also source data used to identify available nursing resources within each HSA by ethnic and racial category.

Requirements Analysis Component

There are six steps in the analytical process for making requirements projections:

- Differentiating the client population
- Assessing the health needs of the population
- Formulating a health strategy
- Choosing the level and mix of nursing services
- Determining the level and mix of nurse staffing
- Staffing schools of nursing

Minority health concerns are addressed from several perspectives in the Requirements Analysis component. By differentiating the population, one can easily identify HSAs that contain a high concentration of minorities. This provides a systematic method for assessing and evaluating the specific health status and health needs of HSAs with large minority populations. Once these health needs have been determined, the State Model provides a structured approach for developing strategies for serving each population subgroup.

The traditional starting point for assessing the health needs of the population is the examination of morbidity and mortality rates. The number of episodes and the episode-to-population ratios are estimated from the population in each HSA and the sample data from the Health Interview Survey (HIS). From the HIS, morbidity rates are calculated for individuals in the four major regions—West, North-Central, Northeast, and South. In addition, the rates can be calculated for individuals in specific age, sex, and ethnic groups. For example, one can calculate a morbidity rate for black men over 65 and multiply it by the number of people who have those characteristics to produce the estimated number of episodes. These calculations are done for each segment of the population. The results are then summed to give an aggregate number of episodes for the entire population in an HSA.

Therefore, the estimated requirement for nursing personnel produced by the State Model *is* population specific.

Resources Analysis Component

The Resources Analysis component provides an analytical framework, supported by data where available, which can help nurses and health-care planners arrive at a better understanding of the probable availability of nursing resources one to five years into the future. The analytical framework offers a logical, systematic approach to planning for nursing resources at state and HSA levels. Although this part of the State Model does not itself provide answers, predict the future, or arrive at solutions, it does allow the user to make defensible projections of the number and composition of nursing resources that should be available to meet changing health needs.

The Resources Analysis Component takes into account six factors that influence the availability of nursing resources: 1) the educational system, 2) migration patterns, 3) the licensing process, 4) labor force participation, 5) the work force, and 6) the inactives.

Data from the ANA Follow-up Study and the NLN Special Survey are the primary sources of minority data used in the Resources Analysis component. These data are used to identify the number of American Indian, Oriental, black, and Hispanic students enrolled in various nursing educational programs, as well as the number of graduates. Reports from these data are prepared by state and HSA levels of aggregation. Data from the Follow-up Study are used to provide limited information on the ethnic/racial composition of the available nursing work force.

Joint Analysis Component

Essentially, this component provides a systematic method for analyzing the results from the Resources Analysis component and those from the Requirements Analysis component. The specific health needs of each population subgroup are assessed in conjunction with determining the number and type of nurses needed and available to provide required health services.

The population-oriented approach of the State Model, then, provides a structure for highlighting and analyzing the health-service needs of specific populations. Minority health concerns are an integral part of this approach.

Annotated Bibliography of Project Publications and Reports

The publications and reports resulting from the Analysis and Planning for Improved Distribution of Nursing Personnel and Services Project have been or will be distributed by the Western Interstate Commission for Higher Education and the Division of Nursing of the U.S. Department of Health, Education, and Welfare.

Copies of the documents are included in the nursing information component of the National Health Planning Information Center (NHPIC). All except the state summary profile reports and the state-by-state projections of requirements are or will be available through the National Technical Information Service (NTIS).[1] Those state reports are available through WICHE.[2]

Publications

Elliott, Jo Eleanor, and Kearns, Jeanne M. *Analysis and Planning for Improved Distribution of Nursing Personnel and Services, Final Report.* Hyattsville, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 79-16), 1978. HRP 0900556.

A final report of the activities carried out during the contract period. Includes reports on the State Model, Field Development and Pilot Testing of the State Model, National Model, Taxonomy Committee, Long-Range Data Collection and Use, Regional Centers, Training, National Conferences, New and Emerging Roles, and the Panel of Expert Consultants. Includes a listing of all participants associated with the project.

Gingras, Pauline, ed. *National Conferences.* Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-3), 1976. HRP 0023109.

Includes the proceedings of the Second National Conference held in Denver, July 21-23, 1976. Includes the major addresses given at the first and second conferences, the issue papers presented at the conferences, and workshop discussions. Includes summaries, and descriptions of each of the activities carried out during the 18 months of the project: State Model, Field Development, National Model, Taxonomy Committee, Regional Centers, Training, Long-Range Data Collection, and New and Emerging Nursing Roles.

Kodadek, Sheila, ed. *Inventory of Innovations in Nursing.* Bethesda, Md.: U.S. Department of Health, Education, and Welfare (DHEW Publication No. HRA 77-2), 1976. HRP 0023110.

A collection of examples of approaches to improving the distribution and utilization of nursing personnel and services. Entries include information on nursing roles, practice sites, target populations, payment mechanisms, and evaluations. Also included are summary reports of the seven demonstration projects funded through the Analysis and Planning Project, and a cost-effective report on four of these projects. Useful to nurses in service settings and in educational programs, and to health planners.

Reports

Bergan, Tom, and Hirsch, Gary. *A National Model of Supply, Demand, and Distribution, Final Report.* Boulder, Colo.: Western Interstate Commission for Higher Education, 1977. HRP 0900525.

An extended description of and documentation for the National Model, including quantification of variables. Of interest to those who wish a detailed account of the model's development, components, and usability.

______________. *A National Model of Supply, Demand, and Distribution, Summary Report.* Boulder, Colo.: Western Interstate Commission for Higher Education, 1976. HRP 0023104.

A nontechnical report of the National Model, including model conceptualization and use. Intended for persons interested in nurse health manpower planning, particularly policy evaluation.

Bright, Esther. *The Field Development Component of the State Modeling Activities, Final Report.* Boulder, Colo.: Western Interstate Commission for Higher Education, 1977. HRP 0017545.

Includes a documentation of the field development of

[1] To order through NTIS, the document number and prepayment should be sent to National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, Virginia 22161.

To obtain the price of NTIS documents, call the Sales Desk, (703) 557-4650, and cite the HRP identification number.

[2] To purchase through WICHE, contact Publications Secretary, P.O. Drawer P, Boulder, Colorado 80302.

the State Model and case studies of the five states involved in the development: Illinois, Iowa, Louisiana, New Mexico, and Vermont. Also includes a bibliography of recent state nursing studies.

Collier, Douglas J., with Segall, Mary. *A Blueprint and Recommendations for Improved Nursing-Related Data*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1977. HRP 0900526.

Examines the need for nursing-related data and assesses the ability of existing data and data-collection efforts to serve that need. Describes a framework for looking at nurse-related data, as well as a set of categories and definitions for most commonly used data elements. Includes a broad set of recommendations for improving the data used in planning at the state, regional, and national levels for nursing personnel and services.

Gingras, Pauline. *Regional Centers, Final Report*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1977. HRP 0017900.

Includes a description of the regional center activities within regions of New England, the South, the Midwest, and the West. A national perspective, as well as recommendations for future national and regional activities is presented.

Gray, Robert, and Sauer, Ken. *Nursing Resources and Requirements: A Guide for State-Level Planning*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978. HRP 0900588.

Written to assist state-level decision makers in nursing, health planning, and higher education communities, the *Guide* begins with a theoretical discussion of the important aspects of planning for nursing resources and requirements at state and substate levels. It then explains how recent information about nursing and related health care factors may be used to reach specific conclusions regarding issues raised in the theoretical discussion. Finally, the *Guide* describes mathematical procedures that may be used to project nursing resources and requirements over a one- to five-year period, given a particular set of user-specified assumptions.

Lum, Jean L. J., with Leonhard, Gregory. *Panel of Expert Consultants: Final Report*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978. HRP 0900555.

Includes the recommendations of the Panel of Expert Consultants and the justification for criteria for components given in *Nursing Resources and Requirements: A Guide for State-Level Planning*, as used in developing nationally derived national and state-by-state estimates for nursing requirements. The resulting estimates for the nation and for each state, by 1982, are presented in tabular form. Background information on the current situation is included.

Mactavish, J. Kevin, ed. *A Manual for Training in Analysis and Planning for Improved Distribution of Nursing Personnel and Services*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1976. HRP 0017544.

A compilation of training materials and implementation procedures resulting from information/instructional activities carried out during the Analysis and Planning Project. Intended for educational personnel to plan and conduct training for nurse leaders to use data bases and analytical models as planning tools for improving the distribution of nursing expertise.

Makowski, David, and Smith, Mark. *Users' Manual for the Profile Report Generation System*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978. HRP 0900589.

Provides the necessary information and instructions to produce the individual nursing and health-care profile reports described in *Nursing Resources and Requirements: A Guide for State-Level Planning*, using the Profile Data Base and the Computerized Profile Report Generation System. This technical document is intended for persons with some background in computing systems and data processing.

Makowski, David, and Traut, Ken. *Users' Manual for the Requirements Calculation Software*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978. HRP 0900590.

Facilitates the generation of a range of requirements projections for nursing personnel based on the assumptions worksheets, mathematical equations, and procedures described in *Nursing Resources and Requirements: A Guide for State-Level Planning*. The *Manual* is a technical document that provides the necessary information and instructions for entering the requirements assumptions to the software to produce sets of projections. This publication is intended for persons with some knowledge of computing systems.

Smith, Mark K., with Felix, Jerome. *A Directory of Nursing-Related Data Sources*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1977. HRP 0017087.

A catalogue and description of more than 60 sources of nursing-related data applicable to the study of nursing manpower and related areas at state and substate levels. Provides detailed information that will allow users to obtain access to these sources.

Smith, Mark. *Users' Manual for the Profile Data Base*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978. HRP 0900591.

A technical document providing the information necessary to facilitate use of the data base. Gives detailed specifications and descriptions of the data base as well as information concerning the more than 15 data sources that were utilized in its creation.

State Summary Nursing Profile Reports, Volumes 1 through 51. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978.

Contain the state-level nursing and health-care profile reports for the 50 states and the District of Columbia described in *Nursing Resources and Requirements: A Guide for State-Level Planning*. These documents are intended for planners at the state level who either do not have access to computing facilities or who do not choose to use the *Users' Manual for the Profile Data Base* and the *Users' Manual for the Profile Report Generation System*.

State-by-State Projection of Requirements for Nursing Personnel, 1982. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978.

Includes the computer runs for each state, using the national Panel of Expert Consultants' lower bound and upper bound criteria applied to state-specific data on population, health facilities, occupancy rates, and enrollments.

Woellhof, Ken, and Malowski, David. *Users' Manual for the Resources Calculation Software*. Boulder, Colo.: Western Interstate Commission for Higher Education, 1978. HRP 0900592.

Facilitates the generation of a range of resources projections for nursing personnel based on the assumptions worksheets, mathematical equations, and procedures described in *Nursing Resouces and Requirements: A Guide for State-Level Planning*. The *Manual* is a technical document that provides the necessary information and instructions for entering the resources assumptions into the software to produce sets of projections. This publication is intended for persons with some knowledge of computing systems.

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Western Interstate Commission for Higher Education

The Western Interstate Commission for Higher Education (WICHE) is a non profit agency created by the governors and legislators of the 13 western states.*

The organization is directed by a Commission composed of three Commissioners from each of the 13 states appointed by their respective governors. The Commission functions within the framework of an interstate compact.

WICHE is funded by annual dues from each state, and by voluntary contributions from those states participating in the mental health and human services program. These state funds are supplemented by private foundation and public agency funds.

WICHE's goals are to improve the accessibility of postsecondary education to all western citizens; assist member states in maintaining an adequate supply of technically and professionally educated persons; and help the states increase the effectiveness and efficiency of their higher education programs and services.

Western Council on Higher Education for Nursing

The Western Council on Higher Education for Nursing (WCHEN) is made up of representatives of 163 collegiate schools of nursing in the West who operate through the General Council, the Executive Board, the Steering Committees, and within WICHE's goals. It is advisory to the Western Interstate Commission for Higher Education.

WCHEN is funded with money from WICHE's state dues, and with nominal participation fees from schools. Its projects are funded by grants and contracts from private foundations and federal agencies.

WCHEN has operated for over 20 years; it will continue to focus on the improvement of nursing education and on increasing the quality of health care of the people of the West. Among WCHEN's goals are to: conduct an ongoing study of regional needs and resources in nursing; establish the expectation that all professional nurses will be competent to function in a primary care role; substantially increase nursing research efforts; and increase the number of ethnic minorities and men in the nursing profession.

National Center for Higher Education Management Systems

The National Center for Higher Education Management Systems (NCHEMS) is an independent nonprofit organization working to improve planning and management in postsecondary education.

A board of directors representing postsecondary education state agencies, and the legislative and executive branches of state and federal government, along with a National Advisory Council direct the organization.

NCHEMS is funded primarily by the National Institute of Education, an agency of the U.S. Department of Health, Education, and Welfare, and with support from private foundations, corporations, individuals, and other federal agencies.

NCHEMS goals are to provide college administrators with new management concepts, new processes, and new tools that will encourage the most efficient, effective, and equitable ways to improve the planning and management of higher education.

*Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

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